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2011 PRECISON STRIKE ANNUAL REVIEW

Fort Walton Beach, FL

23 – 24 February 2011

Agenda

WEDNESDAY, FEBRUARY 23, 2011

KEYNOTE ADDRESS—INTERNATIONAL COOPERATION:
- *Major General Michael A. Snodgrass, USAF*—Assistant Deputy Under Secretary of the Air Force (International Affairs), Office of the Under Secretary of the Air Force

NATIONAL MILITARY STRATEGY—SHARED INTERESTS/SHARED RESPONSIBILITIES WITH COALITION PARTNERS:
- *Rear Admiral John Roberti, USN*—DD Joint Strategic Planning, Strategic Plans & Policy Directorate (J-5), The Joint Staff

USPACOM PRECISION STRIKE SESSION:
Chair: *Captain Mike Doran, USN*—Office of Director for Operations (J3), USPACOM
- Japan—Image Gyro: *Dr. William Cooper*—AFMC AFRL/RWMW

AIR ARMAMENT CENTER PERSPECTIVE:
- *Major General Charles R. Davis, USAF*—Commander, Air Armament Center & Air Force Program Executive Officer for Weapons, Air Force Materiel Command, Eglin AFB

ACQUISITION AT THE TIP OF THE SPEAR—USSOCOM PERSPECTIVE:
- *James "Hondo" Geurts*—Deputy Director for Acquisition, HQ United States Special Operations Command

WEAPONS SCIENCE & TECHNOLOGY INVESTMENT AREAS:
- *Colonel Kenneth L. Echternacht, Jr., USAF*—Director, Munitions Directorate, Air Force Research Laboratory, Air Force Materiel Command, Eglin AFB

USCENTCOM PRECISION STRIKE SESSION:
Chair: *Colonel Dave Rice, USA*—PM for Precision Rockets, Missiles & Space System
- **Middle East Current Events & Impacts to Precision Strike Needs:** *Dr. Peter Huessy*—President, GeoStrategic Analysis & Senior Defense Consultant,
- **National Defense University Foundation Targeting Issues in the CENTCOM AOR**: *LT COL Matt Johnson, USAF*, Air Force Targeting Center, Air Combat Command
- **Insensitive High Explosives For High Speed Penetrators**: *Dr. Jennifer L. Jordan, Branch Technical Advisor, AFRL*

THURSDAY, FEBRUARY 23, 2011

USSOUTHCOM PRECISION STRIKE SESSION:
Chair: *Michael Droz*—Deputy Director of Operations (J3), United States Southern Command
- Chile: *Major General Humberto Oviedo*—Defense Attache & Chief of the Military Mission to the USA
- Colombia:

U.S. ARMY SECURITY ASSISTANCE COMMAND PERSPECTIVE:
- *Colonel Dave Rice, USA*—Project Manager for Precision Rockets, Missiles & Space Systems, Huntsville AL

WEAPONS SYSTEMS ACQUISITION:

- *David Ahern*—Deputy Assistant Secretary of Defense, Portfolio Systems Acquisition, OUSD(AT&L), OSD

USEUCOM & NATO PRECISION STRIKE SESSION:

Chair: *Colonel George Uribe, USAF*—Chief, Operations & Training Div., HQ USAFE/A3T

- France: *Colonel Nicolas Hue* (Armament corps), Defense Cooperation Attaché, French Embassy

Precision Strike Association

presents

Celebrating over 20 years of Excellence

PRECISION STRIKE ANNUAL REVIEW

PSAR-11

PRECISION STRIKE WITH COALITION PARTNERS

FEBRUARY 23-24, 2011











A Proud Affiliate Of NDIA National Defense Industrial Association

The Emerald Coast Conference Center

1250 Miracle Strip Pkwy SE | Ft. Walton Beach, FL 32548

For more information about PSAR-11, please visit our website: www.precisionstrike.org

KEY LEADERS



Major General
Michael A. Snodgrass, USAF
Assistant Deputy
Under Secretary of the Air Force
(Int'l Affairs), Office of the Under
Secretary of the Air Force



Major General
Charles R. Davis, USAF
Commander, Air Armament
Center & Air Force Program
Executive Officer for Weapons,
Air Force Materiel Command,
Eglin AFB

WHY ATTEND PRECISION STRIKE ANNUAL REVIEW 2011

As our Administration continues to review its strategy in Afghanistan, economic stressors further complicate system procurement. Senior leaders from all Services are seeking efficiencies in the current fiscal environment while faced with the prospect of additional diminishing resources.

By attending PSA's Precision Strike Annual Review (PSAR-11) focused on Precision Strike with Coalition Forces that will be co-hosted by the Air Armament Center and Air Force Research Laboratory at Eglin AFB, you will hear from more than 16 Coalition Partners who have been invited to address their top precision strike priorities and budgetary constraints. This approach will offer the precision strike community a unique opportunity to witness a vast and diverse group of coalition partners discussing their precision strike needs. Representatives from four of our Combatant Commands—PACOM, CENTCOM, SOUTHCOM and EUCOM—will chair these precision strike coalition partners sessions.

Further, PSAR-11 will showcase topics on:

- International Cooperation
- Shared Interests/Shared Responsibilities with Coalition Partners
- Air Armament Center Perspective
- Acquisition at the Tip of the Spear—USSOCOM Perspective
- Weapons Science and Technology Investment Areas
- Coalition Policy, Cooperation and Operations
- Weapons Systems Acquisition
- Navy International Program Office Perspective
- Secretary of the Air Force International Affairs Perspective
- U.S. Army Security Assistance Command Perspective

You won't want to miss the presentation of the 15th Annual William J. Perry Award



Dr. John Wilcox
Associate Director for Weapons,
Air Force Research Laboratory,
Eglin AFB



David Ahern
Deputy Assistant Secretary
of Defense, Portfolio Systems
Acquisition, OUSD(AT&L), OSD



James "Hondo" Geurts
Deputy Director for Acquisition,
HQ United States Special
Operations Command



Rear Admiral John Roberti, USN
DD Joint Strategic Planning, Strategic
Plans & Policy Directorate (J-5),
The Joint Staff

PRECISION STRIKE ANNUAL REVIEW

AGENDA
WEDNESDAY, 23 FEBRUARY

0700 **REGISTRATION / CONTINENTAL BREAKFAST** (sponsored by: MBDA)

0750 **ANNUAL REVIEW WELCOME:**
Andy McHugh—Chairman of the Board, Precision Strike Association

0800 **EVENT CHAIR WELCOME:**
Erik Ballinger—Director, Business Development, U.S. Navy & Homeland Security Systems, ATK Washington Operations

0805 **OPENING REMARKS & SPECIAL GREETINGS FROM AAC & AFRL:**
Dr. John Wilcox—Associate Director for Weapons, Air Force Research Laboratory, Eglin AFB

0815 **KEYNOTE ADDRESS—INTERNATIONAL COOPERATION:**
Major General Michael A. Snodgrass, USAF—Assistant Deputy Under Secretary of the Air Force (International Affairs), Office of the Under Secretary of the Air Force

0900 **NATIONAL MILITARY STRATEGY—SHARED INTERESTS/SHARED RESPONSIBILITIES WITH COALITION PARTNERS:**
Rear Admiral John Roberti, USN—DD Joint Strategic Planning, Strategic Plans & Policy Directorate (J-5), The Joint Staff

0940 **NETWORKING REFRESHMENT BREAK** (sponsored by: Pratt & Whitney)

1000 **USPACOM PRECISION STRIKE SESSION:**
Chair: *Captain Mike Doran, USN*—Office of Director for Operations (J3), USPACOM
Scene Setter Overview: *Captain Mike Doran, USN*
Stage Setter Overview on AFRL initiatives with Singapore/Australia/Japan:
Dr. Mikel M. Miller—Chief Scientist, Air Force Research Laboratory, AFMC
- **Singapore:** Navigation Technologies: *Dr. Mikel M. Miller*
- **Australia:** *Dr. Mikel M. Miller*
- **Japan—Image Gyro:** *Dr. Timothy J. "T.J." Klausutis'* designated rep.—AFMC AFRL/RWGI

1145 **LUNCHEON & 15TH ANNUAL WILLIAM J. PERRY AWARD CEREMONY**
(sponsored by: Kaman Precision Products)
- William J. Perry Award Ceremony & PSA Chairman's Remarks: *Andy McHugh*
- Presentation of William J. Perry Award: *Major General Charles R. Davis, USAF*

1315 **AIR ARMAMENT CENTER PERSPECTIVE:**
Major General Charles R. Davis, USAF—Commander, Air Armament Center & Air Force Program Executive Officer for Weapons, Air Force Materiel Command, Eglin AFB

1400 **ACQUISITION AT THE TIP OF THE SPEAR—USSOCOM PERSPECTIVE:**
James "Hondo" Geurts—Deputy Director for Acquisition, HQ United States Special Operations Command

1445 **REFRESHMENT BREAK** (sponsored by: Pratt & Whitney)

1500 **WEAPONS SCIENCE & TECHNOLOGY INVESTMENT AREAS:**
Colonel Kenneth L. Echternacht, Jr., USAF—Director, Munitions Directorate, Air Force Research Laboratory, Air Force Materiel Command, Eglin AFB

1545 **USCENTCOM PRECISION STRIKE SESSION:**
Chair: *Colonel Dave Rice, USA*—PM for Precision Rockets, Missiles & Space System
Scene Setter Overview—including UAE, Jordan, Egypt & Bahrain Reflections:
Colonel Dave Rice, USA
- **Middle East Current Events & Impacts to Precision Strike Needs:**
Dr. Peter Huessy—President, GeoStrategic Analysis & Senior Defense Consultant, National Defense University Foundation
- **Targeting Issues in the CENTCOM AOR:** *Colonel Phil Pratzner, USAF*
Commander, Air Force Targeting Center, Air Combat Command

1730 **EVENING RECEPTION WITH HEAVY HORS D'OEUVRES & BRIEF ANNUAL MEETING**
Andy McHugh—Annual Meeting Chair (sponsored by: Northrop Grumman)



Captain Mike Doran, USN
Office of Director for Operations (J3), USPACOM



Colonel Ken Echternacht, USAF
Director, Munitions Directorate, Air Force Research Laboratory, Air Force Materiel Command



For more information on the Honorable William J. Perry, the award and updates about the recipient, please check our website:
www.precisionstrike.org/perry_award

AGENDA
THURSDAY, 24 FEBRUARY



Mike Droz
Deputy Director of Operations (J3)
HQ USSOUTHCOM



Colonel Dave Rice, USA
PM for Precision Rockets, Missiles & Space Systems



Rino Pivirotto
Executive Director, Navy Int'l Programs Office

0730 **BREAKFAST BUFFET** (sponsored by: Lockheed Martin)

0830 **USSOUTHCOM PRECISION STRIKE SESSION:**
Chair: *Michael Droz*—Deputy Director of Operations (J3), United States Southern Command
Scene Setter Overview: *Michael Droz*
- **Argentina:** TBD
- **Chile:** *Major General Humberto Oviedo*—Defense Attache & Chief of the Military Mission to the USA
- **Colombia:** TBD
- **South America – Technology Cooperative Programs:** *Dr. Mikel M. Milller*

1000 **HOW DEFENSE IS SHAPING UP IN CONGRESS**
Dr. Peter Huessy—President, GeoStrategic Analysis & Senior Defense Consultant, National Defense University Foundation

1020 **NETWORKING REFRESHMENT BREAK** (sponsored by: ITT)

1040 **U.S. ARMY SECURITY ASSISTANCE COMMAND PERSPECTIVE:**
Colonel Dave Rice, USA—Project Manager for Precision Rockets, Missiles & Space Systems, Huntsville AL

1120 **NAVY INTERNATIONAL PROGRAM OFFICE PERSPECTIVE:**
Rino Pivirotto—Executive Director, Navy International Programs Office

1200 **LUNCHEON** (sponsored by: ATK)

1245 **WEAPONS SYSTEMS ACQUISITION:**
David Ahern—Deputy Assistant Secretary of Defense, Portfolio Systems Acquisition, OUSD(AT&L), OSD

1330 **USEUCOM & NATO PRECISION STRIKE SESSION:**
Chair: *Colonel George Uribe, USAF*—Chief, Operations & Training Div., HQ USAFE/A3T
Scene Setter Overview: Colonel George "Tater" Uribe, USAF
- **United Kingdom:** *Group Captain Rob Adlam*—Royal Air Force, Air Attache'
- **Germany:** Hard & Deeply Buried Targets Solutions:
  Dr. Holger Sohn—Liaison Engineer, Air Armament Technology,
  Federal Republic of Germany Liaison Office for Defense Materiel USA/Canada
- **France:** *Colonel Nicolas Hue* (Armament corps)
  Defense Cooperation Attaché, French Embassy

1515 **CLOSING REMARKS**

Special thanks to Air Armament Center & Air Force Research Laboratory for co-hosting PSAR-11.

PSAR PROGRAMS COMMITTEE

PSA Programs Chair: *Ginny Sniegon* | PSA Programs Vice-Chair: *Captain Mike Flanagan, USN*
Annual Review Event Chair: *Erik Ballinger* | International Chairs: *Jim Pennock & Earle Rudolph*
Annual Meeting Chair: *Andy McHugh* | PSA Executive Director: *Dawn Campbell, CMP*
NDIA International Division: *Britt Bommelje & Alexis Larkin*

U.S. MILITARY CHAIRS

Navy: *CAPT Larry Burt, USN* | Marine Corps: *COL Robert Claypool. USMC*
Air Force: *Col Mike Fantini, USAF* | Army: *LTC Ken Britt, USA (Ret)*
The Joint Staff: *Lt Col Tim Farquhar. USAF*

Registration

Online: Register online for the symposium at http://www.precisionstrike.org. You will be directed to the NDIA registration web page. You will receive an e-mail confirmation after you use the CONFIRM button on the web page. When registering online, please review your information then "submit" and "confirm" your entry. PLEASE make sure you check your account information for accuracy (i. e: spelling of name, address, company name, e-mail address, phone number etc.).

Fax: Complete registration form with payment information and fax to 703-527-5094

Mail: Complete registration form with payment to: PSA Event #1PPR, 2111 Wilson Blvd., Suite 400 | Arlington, VA 22201-3601

Acceptable forms of payment include: Checks (with mailed registrations); Credit cards: Visa, Master Card, American Express, and Diners Club. Discover Card NOT accepted.

Payment must be made at time of registration. A late fee of $50 will be added to any registration received after February 16, 2011. Please register on site after the deadline date. Non-member fee includes individual membership in PSA for a one-year period.

Final Agenda and Attendance Roster

A final (revised) agenda and attendance roster will be distributed at the meeting. In order to appear on the roster, your completed registration and payment must be received by COB Wednesday, February 16, 2011. An updated roster will not be printed after the conference.

Disabilities

PSA/NDIA supports the Americans with Disabilities Act of 1990. Attendees with special needs should call (703) 247-2590, before Wednesday, February 16, 2011.

Attire

Appropriate dress for this Symposium is business attire for civilians. Military attendees may wear the Uniform of the Day for their respective organizations.

Proceedings

The proceedings for 1PPR will be available for all attendees online 2-3 weeks after the event. The URL for the proceedings will be included in the conference materials to be distributed at the symposium for those who attend. Please note not all presentations are included in the proceedings as the decision to include their presentation is left up to the presenter.

Cancellations and Refunds

All cancellations and refund requests must be received in writing to Precision Strike Association, 2111 Wilson Blvd., Suite # 400, Arlington, VA 22201-3061, fax to: 703-527-5094, or by e-mail: info@precisionstrike.org no later than Wednesday, February 16, 2011. After this date NO refunds will be given for any cancellations. Substitutions are welcome prior to the day of the event. This refund policy applies to all attendees regardless of their method of registration or reason for cancellation.

General Information

Meeting Location



Emerald Coast Conference Center
1250 Miracle Strip Pkwy SE | Ft. Walton Beach, FL 32548
Phone: 850-609-3800
Directions can be found on our website

Accommodations



PSA has reserved a block of rooms at the Four Points Sheraton in Ft. Walton Beach . When making reservations please reference "Precision Strike Association" to obtain the special rate. All rooms on a first come first serve basis-reserve your room early!

Four Points Sheraton-Destin
1325 Miracle Strip Parkway
Ft. Walton Beach, FL 32548
Reservations Toll-Free: (800) 325-3535

Discounted rate: Courtyard: $78
until February 14, 2011.

Additional hotels in meeting vicinity:
(No PSA discounts)

Ramada Plaza Beach Resort
(800) 874-8962
1500 Miracle Strip Pkwy SE
Fort Walton Beach, FL 32548

Hampton Inn - Mary Esther
(800) 426-7866
480 E Miracle Strip Parkway
Mary Esther, FL 32569

Emerald Coast Inn and Suites
(800) 408-2200
1214 Miracle Strip Pkwy
Fort Walton Beach, FL 32548

QUESTIONS?

Call or email Dawn Campbell
(703) 247-2590 or
dcampbell@precisionstrike.org

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Precision Strike Annual Review
February 23-24, 2011
East Coast Conference Center | Ft. Walton Beach, FL

SPONSOR

All sponsorships will receive recognition in pre-conference advertising, all onsite materials (attendee's list, final program, cover of biography package). Sponsorship also includes your organization's name on the PSA website, on-site slide presentation shown at each break, a prominent sign at a highly visible location in the conference venue and a-100 word company profile in the final program. All sponsorships are reserved on a first come - first serve basis.

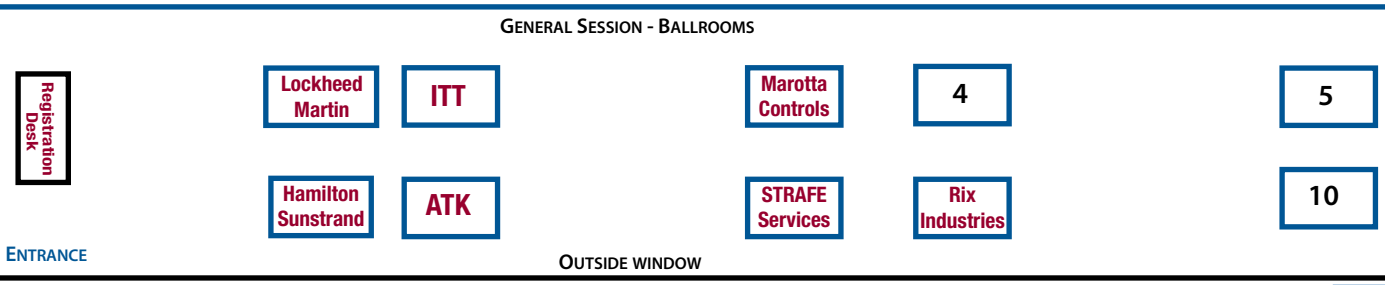
DAY 1		DAY 2	
Continental Breakfast	MBDA	Breakfast Buffet	Lockheed Martin
Luncheon	Kaman Precision Products	Luncheon	ATK
AM & PM Break	Pratt & Whitney	AM/PM Break	ITT
Reception	Northrop Grumman	Attendee Giveaway Sponsor	Marotta Controls

EXHIBIT

WHY EXHIBIT AT PSTS? PSA events are ideal venues for your organization to gather sales leads, close deals and form relationships with your prospects, clients and business partners. Showcase your latest products, ideas and technology in the defense industry. Have direct contact to all levels of government and industry decision makers.

EXHIBITION SPACE: Display space available on a first-come, first-serve basis. Please refer to the exhibit hall diagram for exact display locations. Each 8'x10' display wll consist of a 6' table with two chairs. (Please note: ceiling height in the display area is 11.5' from the floor). Exhibitors will also receive recognition in the onsite conference brochure, attendee's list and slide presentation shown at each break.

EXHIBITION FEES: **PSA Members:** $500 (Includes one registration pass) / **Non-Members:** $750 (Includes one registration pass)
Government/Military/Small Business: Complimentary with paid registration



Please use the form below to reserve space and mail or fax payment to: PSA, 2111 Wilson Blvd. Suite 400, Arlington, VA 22201-3061/ fax with credit card information to 703-527-5094. Questions? Please contact Dawn Campbell at the information below.

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PRECISION STRIKE ANNUAL REVIEW

REGISTRATION FORM

East Coast Conference Center

Ft. Walton Beach, FL

February 23-24, 2011— Event #1PPR

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PRECISION STRIKE ASSOCIATION

Ways to sign up: **1. Online with a credit card at www.precisionstrike.org**
2. By fax with a credit card — Fax: 703-527-5094
3. By mail with a check or credit card

☐ Address change needed

PSA Master ID/Membership #_____ Social Security #_____
(if known—hint: on mailing label above your name) *(last 4 digits – optional)*

Prefix _____ First Name_____ MI _____ Last_____
(e.g. RADM, COL, Mr., Ms., Dr., etc.)

Military Affiliation_____ Nickname_____
(e.g. USMC, USA (Ret.) etc.) *(for Meeting Badges)*

Title_____

Organization _____

Street Address_____

Address *(Suite, PO Box, Mail Stop, Building, etc.)*_____

City_____ State_____ Zip_____ Country_____

Phone_____ ext._____ Fax _____

E-Mail_____

Signature*_____ Date_____

Preferred way to receive information

Conference information ☐ Address above ☐ Alternate *(print address below)* ☐ E-mail

Subscriptions ☐ Address above ☐ Alternate *(print address below)*

Alternate Street Address _____

Alternate Address *(Suite, PO Box, Mail Stop, Building, etc.)* _____

City _____ State_____ Zip _____ Country _____

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Primary Occupational Classification. *Circle ONE.*

A. Defense Business/Industry
B. R&D/Laboratories
C. Army
D. Navy
E. Air Force
F. Marine Corps
G. Coast Guard
H. DOD/MOD Civilian
I. Gov't Civilian (Non-DOD/MOD)
J. Trade/Professional Assn.
K. Educator/Academia
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M. Non-Defense Business
N. Other _____

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Circle ONE.

A. Senior Executive
B. Executive
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E. Professor/Instructor/Librarian
F. Ambassador/Attaché
G. Legislator/Legislative Aide
H. General/Admiral
I. Colonel/Navy Captain
J. Lieutenant Colonel/Commander/ Major/Lieutenant Commander
K. Captain/Lieutenant/Ensign
L. Enlisted Military
O. Other _____

Year of birth *(Optional)* _____

Registration Fees

	DAY 1	DAY 2	BOTH DAYS
PSA/NDIA Member*	__$200	__$200	__$400
Non-Member**	__$220	__$220	__$440
Government/Academia	__$100	__$100	__$200
Small Business	__$100	__$100	__$200

(Speakers - please FAX registration-cannot be processed online)

* Including NDIA and all affiliates | ** Includes a free one-year PSA membership and National Defense magazine for Military and Government employees (first time members only).

Registration DEADLINE: February 16, 2011

REGISTRATION FEES WILL INCREASE $50 AFTER THIS DATE

NO refunds for cancellations received after this date.

Substitutions Welcome! Please email request before the day of the event.

TEAM DISCOUNT! REGISTER 2 & GET 3RD PERSON 50% OFF!
ALL REGISTRATIONS MUST BE COMPLETED AT THE SAME TIME.
OFFER VALID UNTIL FEB 16, 2011

HOW DID YOU HEAR ABOUT THIS EVENT?

☐ Brochure Mailing ☐ PSA Website ☐ NDIA Website ☐ Other:_____
☐ Email ☐ Twitter ☐ Linked-In ☐ Word of Mouth

Payment Options

☐ **Check** *(payable to PSA)* ☐ **VISA** ☐ **MasterCard** ☐ **Amex**
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If paying by credit card, you may return by fax to (703) 527-5094.

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Name on Card: _____

Signature _____ Date _____

Register online today!

Questions?

Contact: Dawn Campbell
Office: (703) 247-2590 (fax) 703-527-5094

Mail to: Precision Strike Association (PSA)
Event #1PPR
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For more information, please see our website:
www.precisionstrike.org or email:info@precisionstrike.org

Affiliate: National Defense Industrial Association

Calendar of Events

PRECISION STRIKE SUMMER FORUM

More information TBD - Please check our website: www.precisionstrike.org

PRECISION STRIKE TECHNOLOGY SYMPOSIUM

Date: October 26-27, 2011
Theme: Precision Strike Improvements to Support US Global Influence
Location: Johns Hopkins University Applied Physics Laboratory—Kossiakoff Center, Laurel MD
This symposium will be held at the SECRET/NOFORN Level

For more information on these events or membership, please contact the PSA office directly.

PRECISION STRIKE ASSOCIATION
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Precision Strike Annual Review



U.S. AIR FORCE

Air Armament Center Perspective

War-Winning Capabilities…

On Time, On Cost

Charles “CR” Davis, Maj Gen, USAF
Program Executive Officer for Weapons
Commander, Air Armament Center
23 February 2011

Integrity - Service - Excellence



DEFENSE THREAT REDUCTION AGENCY



AFRL MUNITIONS



AIR ARMAMENT CENTER



AFOTEC Det 2



53rd WING



20th SPCS





JOINT FIRES INTEGRATION AND INTEROPERABILITY TEAM



NAVY EOD SCHOOL

COAST GUARD



ARMY RANGERS



ARMY 7th SFG



AFSOC (919th and 1st SOW)



33rd WING



What AAC Does

From Concept To Employment

- **Science & Technology w/ AFRL, DTRA and others: Develop the idea and produce a tech demonstration**
- **Product Support w/ Acquisition Organizations: Manage weapon lifecycle development**
- **Conduct Developmental and Operational Test & Evaluation to prove weapon readiness**
- **Sustain and demil the weapon stockpile with ALCs and sister services**
- **Run an installation to support 4 AF MAJCOMs, all DoD services and deployed forces in every combat area**

Arming the Warriors

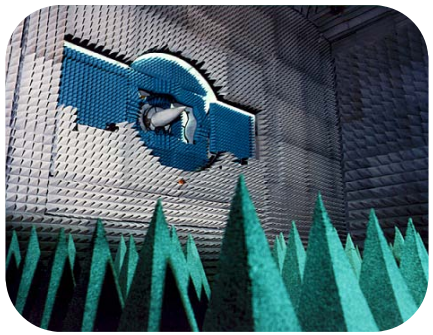
Transition Technology To Weapon Systems And Provide War Winning Capabilities On Time, On Cost

AAC Land and Water Ranges



Largest Element in DoD's MRTFB Structure

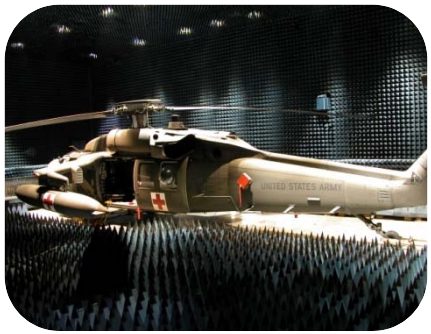
AAC Strategic Test Assets



Guided Weapons Evaluation Facility (Eglin)



McKinley Climatic Lab (Eglin)



Joint Preflight Integration of Munitions and Electronic Systems (Eglin)



Mobile & Fixed Targets (Eglin)



46th Command and Control Test Squadron (Eglin)



Holloman High Speed Test Track (New Mexico)



National Radar Cross-Section Test Facility (New Mexico)



Landing Gear Test Facility (Ohio)

Uniquely Relevant National Capability for Future Generations

AAC Acquisitions Mission Areas

- Air Dominance
- Long Range Strike
- Direct Attack
- Mobile Targets Defeat
- Hard and Deeply Buried Targets Defeat
- Low Collateral Damage Systems
- Test & Training Systems
- US Southern Command (USSOCOM) Rapid Acquisition



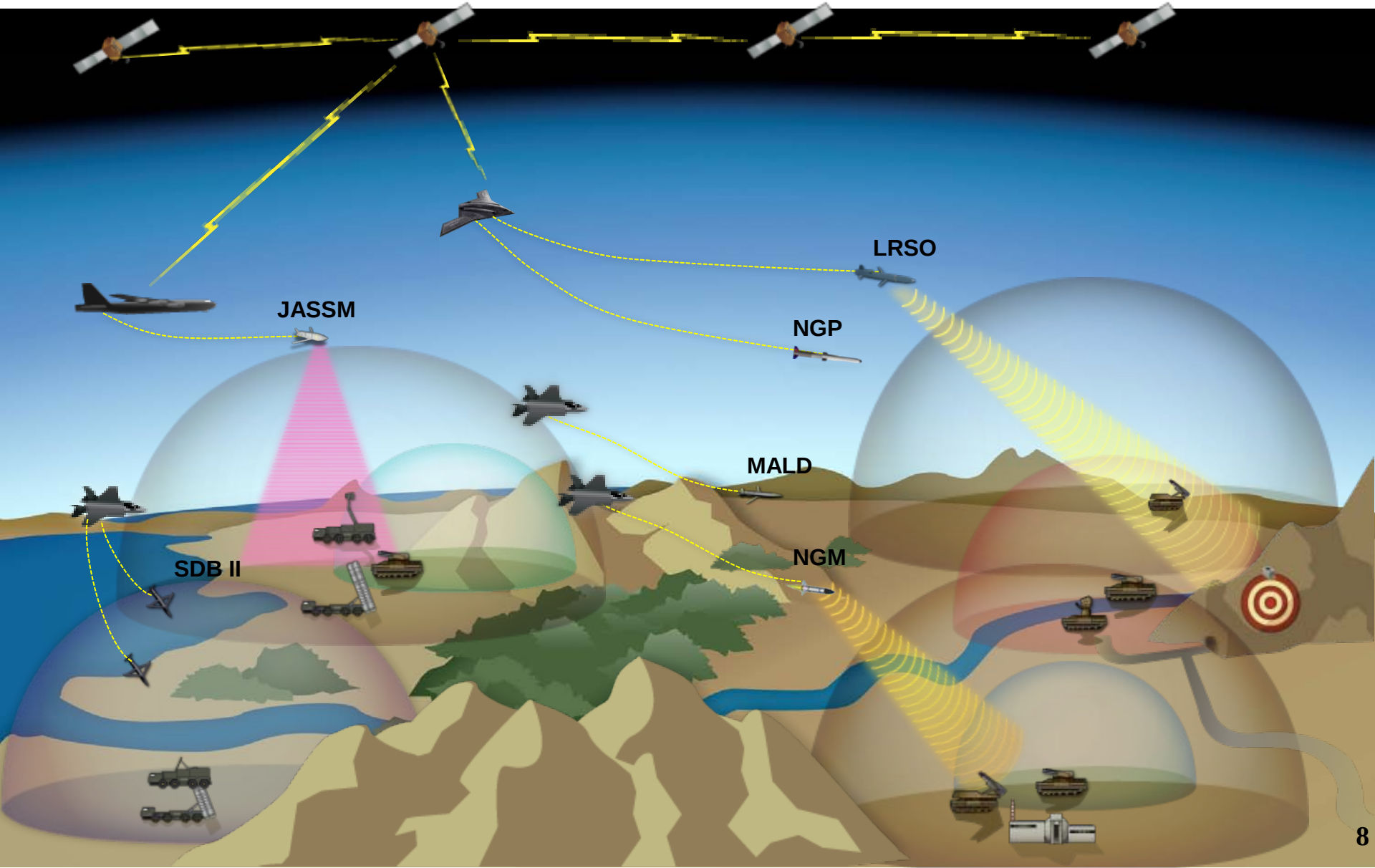
AAC Acquisition Portfolio

- **Air Dominance**
  - AMRAAM
  - HARM Targeting System
  - AIM-9X
- **Long Range Systems**
  - JASSM
  - JASSM-ER
  - MALD
  - MALD-J
  - MALD-J, Inc II
- **Direct Attack**
  - JDAM
  - Laser JDAM
  - MOP JUON
  - JPF
  - HTVSF
  - B-61 Life Ext Program
- **Capabilities Integration**
  - Acquisition Intelligence
  - Capability Planning MS&A
  - Directed Energy
  - HDBT
  - Intra-theater/Close Controlled Strike
  - Air dominance
  - Long Range Strike
- **Advanced Programs**
  - NGM
  - UAI/WPS/IM
  - Medium Cal Ammo
  - JSF Wpns Integration
  - Rapid Acq Cell
  - PL Mk 82 JUON
- **Test & Training**
  - QF-16
  - QF-4
  - AFSAT
  - CRIIS
  - P5 Combat Training System
- **Miniature Munitions**
  - SDB I
  - SDB II
  - FLM

- **5 ACAT I programs**
- **5 ACAT II programs**
- **2 JUON efforts**

- **$52B Portfolio**
- **30,000+ wpns for OEF/OIF**
- **98 FMS cases**

AAC Role in Long Range Strike Family of Systems Development (Notional)

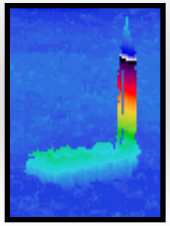


Long Range Strike Weapon Systems

- Long Range Stand-Off
- Next Generation Missile
- Next Generation Penetrator
- Other Potential Weapons
  - JASSM-ER
  - MALD-J Inc II
  - SDB II
  - Other Legacy Weapons

Long Range Strike Weapon Technologies

Advanced Guidance for Surface Targets

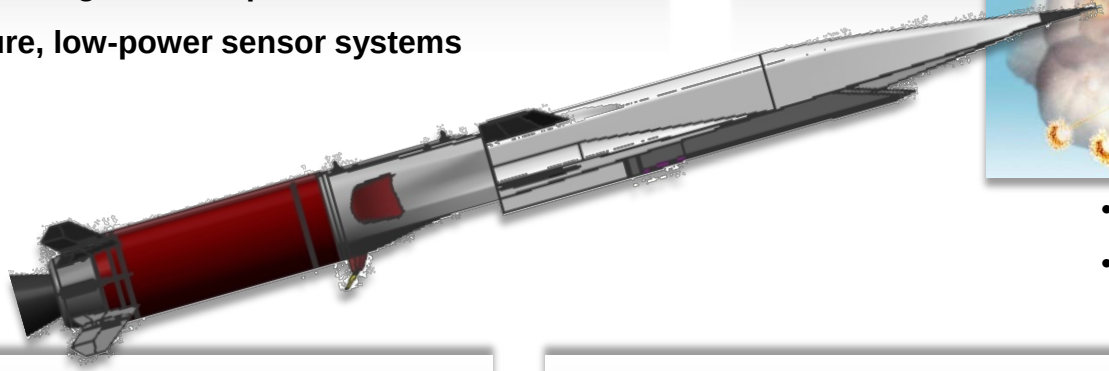


- High temperature sensors and apertures
- Precise sensor pointing through boundary layer
- Millisecond guidance update
- Miniature, low-power sensor systems

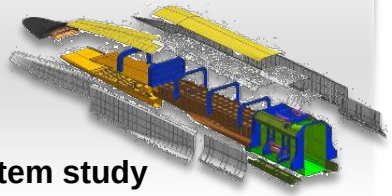
Precision Selectable Effects Warhead



- Tailored blast pulse
- Target coupling



High Speed Weapon Integration and Demonstration



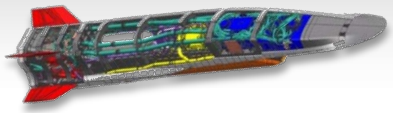
- Platform Integration
- High Speed Dispense
- TRESPAS/TRESPALS2 system study
- Control Surface aerodynamics
- Propulsion and Warhead integration
- Low Cost structure materials

Efficient High Speed Expendable Propulsion

- Scramjet - Mach 6
- High Mach turbojet – Mach 3+



Engine Ground tests



X-51A flight tests

Where We are Today

- Tech base exists to support current primes and engine sub-contractors
  - Reassembled core teams of experienced personnel
- IRAD
  - Leverage ongoing industry efforts
  - Re-examining weight/range trade space for nuclear payload
- Lab Efforts
  - Continued improvements: propulsion, materials, payload
- Acq Planning takes advantage of quick ramp-up to develop LRSO
  - AAC released broad agency announcement, May 2010
  - Received 7 concepts

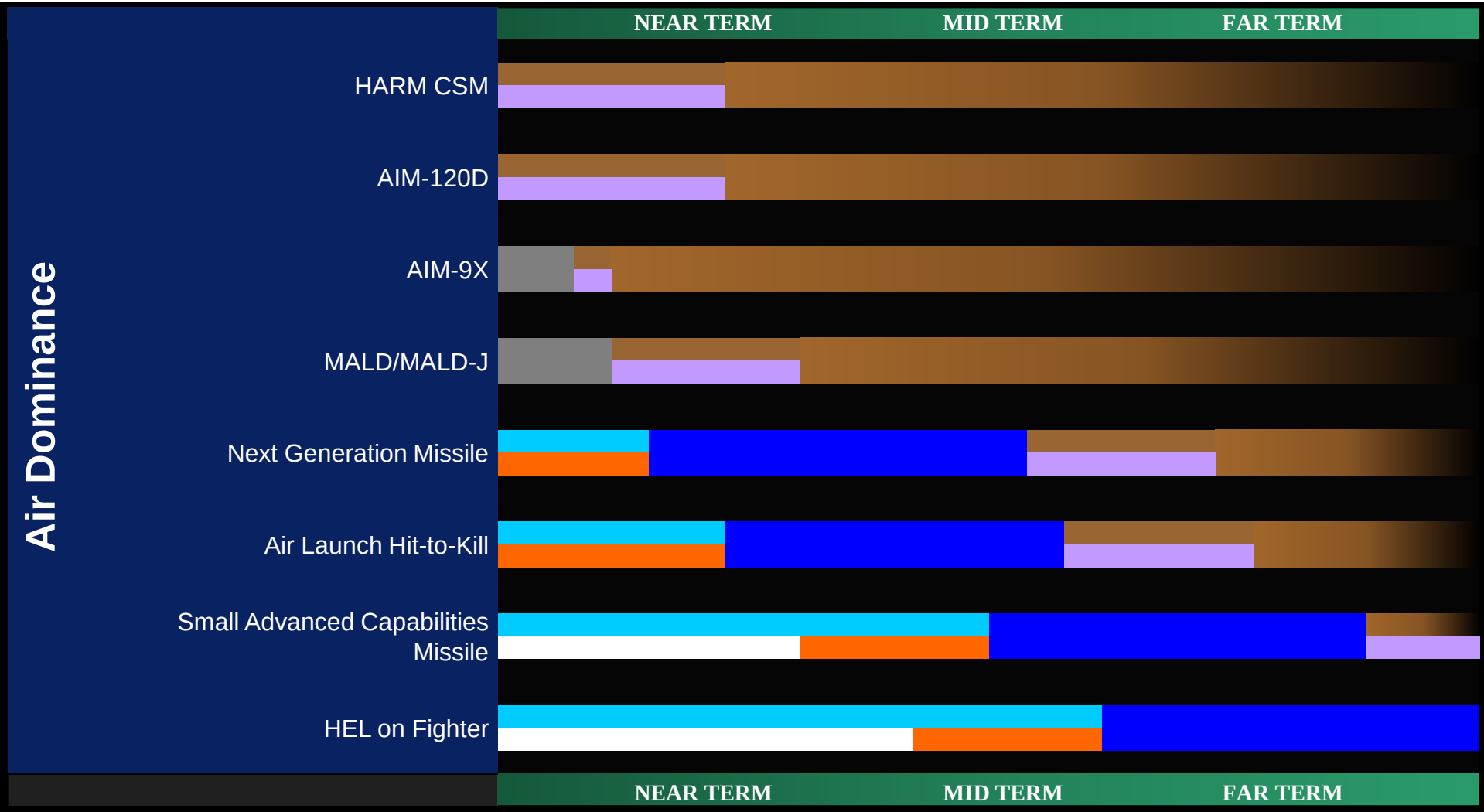
Air Dominance and Next Gen Missile

Challenges, Future Plans

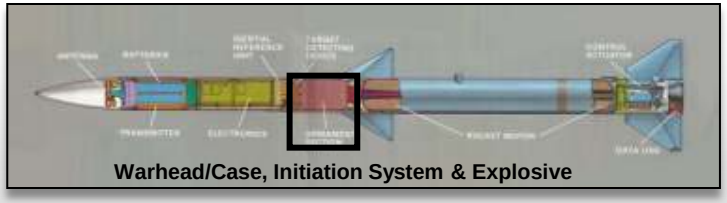
Next Gen Missile (NGM) Attributes & Supporting Tech

- Internal carriage next generation fighters F-22 & F-35
  - Advanced missile packing of dual role capabilities
- Multi-role (Air-to-Air/Ground)
- Increased kinematics (range and speed)
  - Advanced propulsion system (solid rocket or air breather)
- Prosecute surface targets in all environments

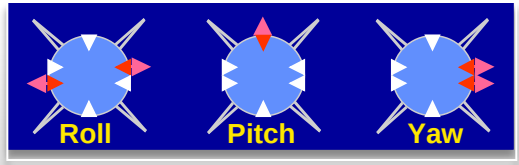
Air Dominance Weapons Roadmap
(Notional)



Air Dominance Technologies



Adaptable Multi-Point Initiated Mass-Focusing, Enhanced Lethality Warhead

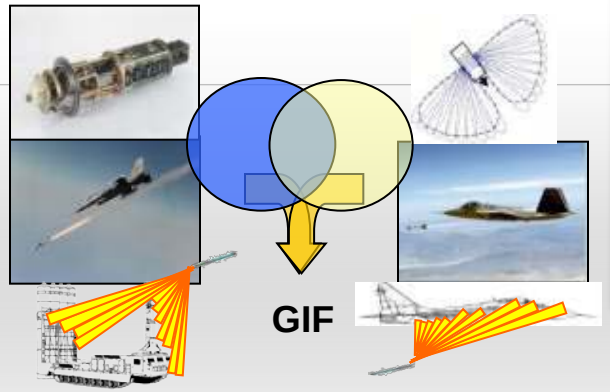




High Maneuverability Hybrid Aerodynamic Fin / Reaction-Jet Control System



Potential Joint Demonstration



Guidance Integrated Fuzing (GIF) Weapon Seeker/Fuzing Integration With Dual-Role Target Set Capability



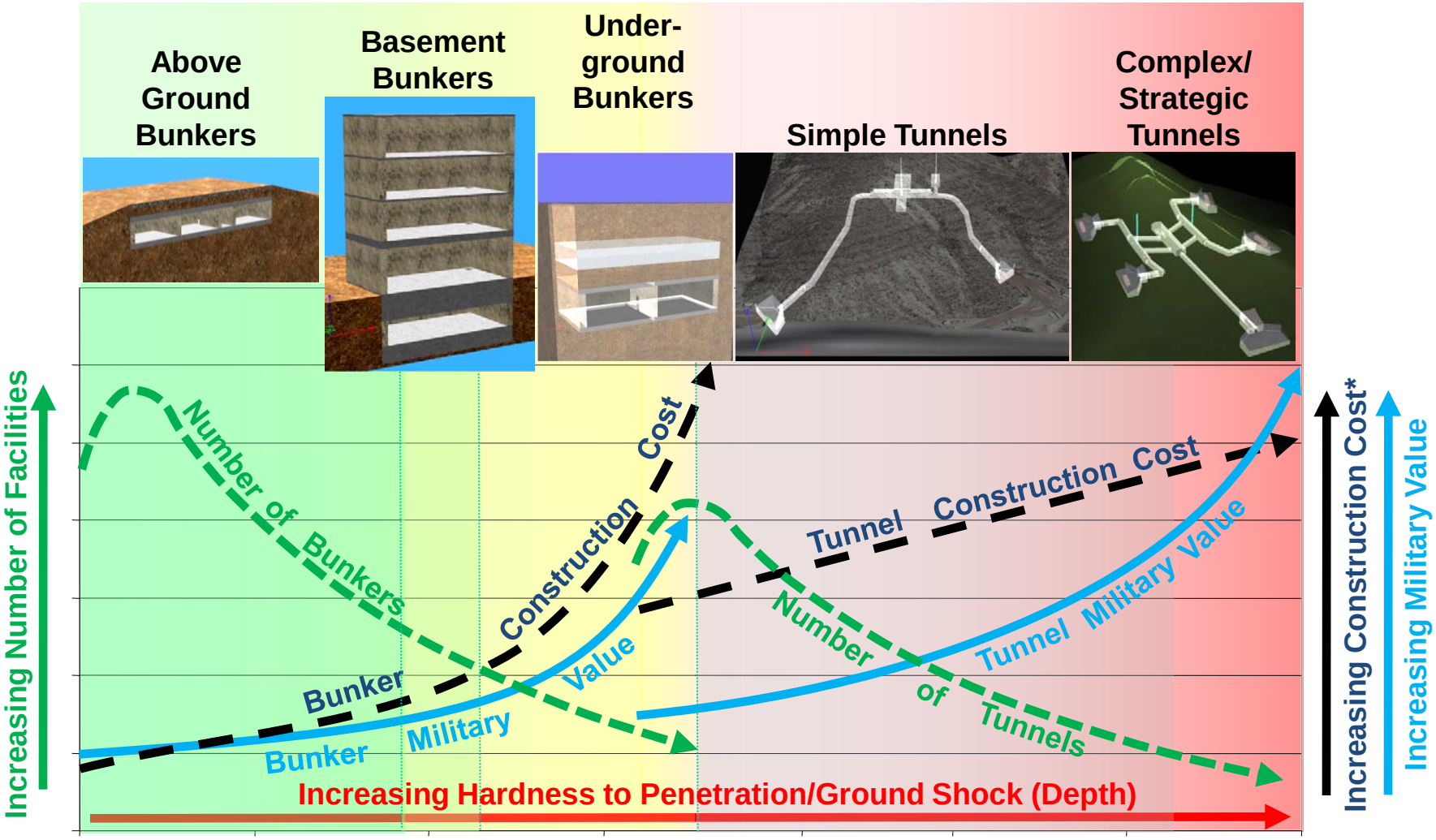
Multi-Pulse Solid Rocket Motor & Other Advanced Propulsion Concepts

ABW/PA No. 10-01-08-438

Next Generation Penetrator

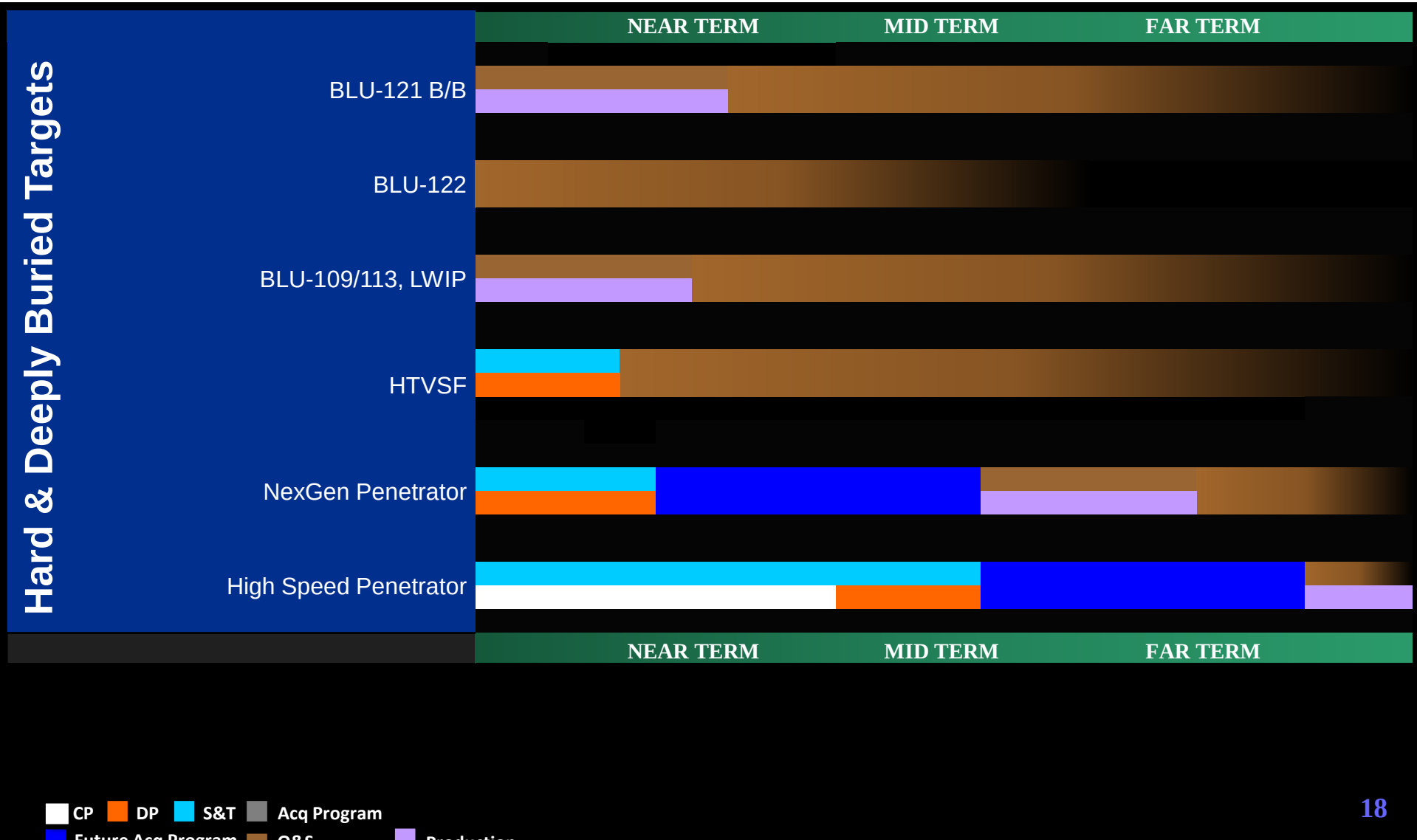
Hardened Deeply Buried Target (HDBT) Defeat for LRS

HDBT Numbers, Hardness, Cost, Value Comparisons



*Equal mission area used for bunker and tunnel cost comparison

HDBT Weapons Roadmap
(Notional)



Next Generation Penetrator

Description

- Analysis of Alternatives for Hard and Deeply Buried Target Defeat
  - Direct attack to long stand-off
  - New systems to P3I of legacy systems
- Potential carriage: New and legacy Fighters/Bombers

Technology Maturation Areas

- Next Generation Warhead/Payload Development
- Survivable Fuze and Explosives Development
- Technologies for Precision Strike

Future Weapon Technology and Industrial Base Needs

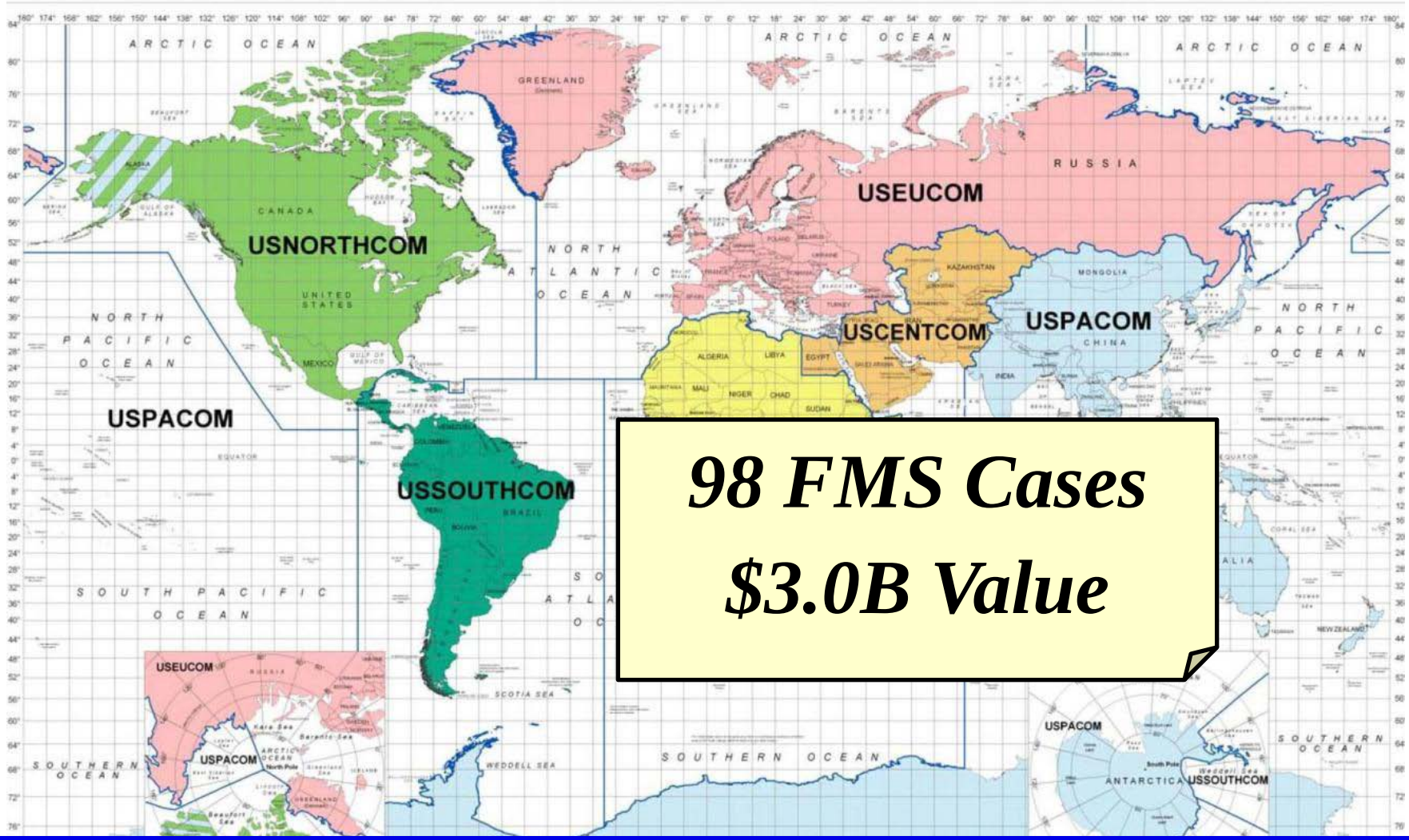
- Penetrator Fuze Survivability and Reliability
  - User HDBT driven requirements
- Warhead Hardening
  - Improvements in HDBT techniques and technologies
- GPS Denied Environment Technologies
  - Current PGMS dependence on GPS technology
- Fuzing
  - Sensing accuracy in all target environments
- Energetic Materials Issues
  - Pre-ignition and insensitive munitions requirements

We Will Need to Understand Where/How Industry Invests IRAD Money—Government Needs to Offer More Vectors

Making Weapons Affordable

- US Department of Defense is working aggressively to reduce development costs
  - Focus areas
    - Emphasizing affordability and control of cost growth
    - Incentivizing productivity and innovation
    - Promotion of real competition
    - Reduction of non-productive processes
- Revamp approach to developmental and operational test
- Find opportunities for international partnering on future developments
- Take advantage of economies of scale
  - FMS partners are key enablers

Active FMS Portfolio

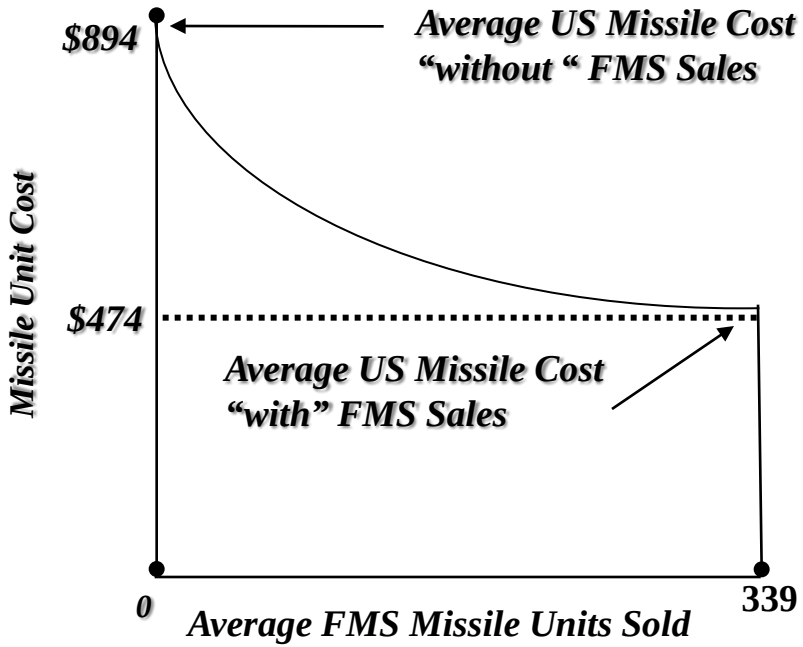


98 FMS Cases

$3.0B Value

Interoperability on the battlefield is facilitated
Development costs are reduced

AMRAAM FMS Sales Benefit



Results of FMS Sales

- $550M+ cost lift over 11 years
- ~ 1,000 additional USG missiles
- Warfighters and Taxpayers Win!



"First Look, "First Shot, First Kill"



International Armaments Cooperation

IAC generally includes:

- Research, development, testing and evaluation (RDT&E) of defense technologies, sub-systems, systems or equipment.
- Joint production (including follow-on support) of defense articles or equipment resulting from a cooperative R&D program.
- DoD procurement of foreign equipment, technology, or logistics support.
- Testing of foreign equipment as part of the Foreign Comparative Testing (FCT) program.

Remaining Interoperable

- Future conflicts will be Joint and fought with coalitions
- Success is enabled by a common framework of technologies and capabilities
- Commonality greatly simplifies combat tactics
  - Air planners utilize common parameters
  - Joint Terminal Air Controller's (JTAC) mission is simplified
  - Common aircrew tactics and procedures
- Interoperability on the battlefield is facilitated by future FMS investment and teaming with international partners
  - JDAM and AMRAAM are leaders in this area
  - Integrated across many air platforms - USAF, Navy, Marines and foreign partners

Issues, Opportunities, and Challenges

Opportunities/Challenges

- Tomorrow's threat demands that tomorrow's weapons must have almost all the capabilities of future aircraft systems
  - Sensors, data links, survivability, flexibility, adaptability, etc.
- However, we must balance complexity of weapons we build with the time required to deliver capability
- We must keep next gen weapons developments in sync with next gen platform requirements
  - Adapting weapons to old platforms or integrating old weapons in new platforms is inefficient and wasteful
- Futures weapons must be designed with reliability in mind and weapons contractors must improve manufacturing performance
  - Supplier management needs focus

Opportunities/Challenges

- Current fuze technology is the weak link for all future weapons
  - Industrial base is crumbling
  - Old mindset that fuzes are “integrated” into weapons must be changed—fuzing must be a system function designed in with a systems engineering approach
- Test systems (drones/ranges/threat systems) are facing very complex requirements
  - Weapons are becoming too smart for the current infrastructure
- Continuing pressure on test infrastructure will slow many programs
- What three wishes for the “Weapons Genie”
  - Conventional explosive fills with the power of “nuclear” materials
  - Design the concept of a fuze out of all weapons
  - Self contained guidance with better accuracy than GPS

Diagnostics for High-Speed Particulate Media Impacts

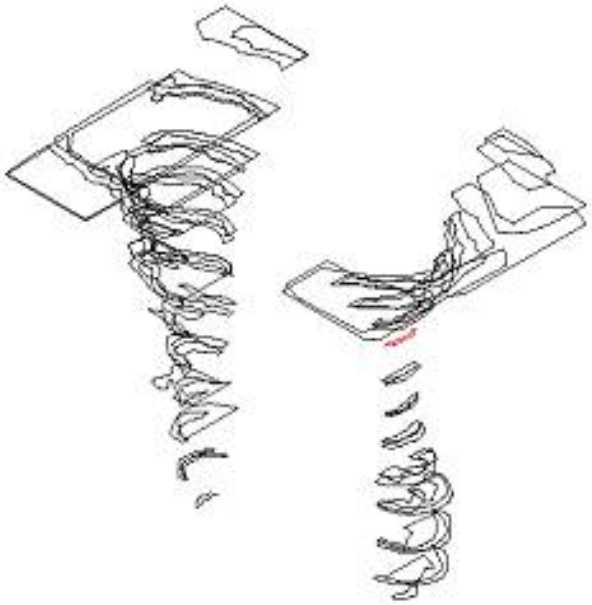
An International Collaboration with Osaka, Tohoku & Chubu Universities, Japan

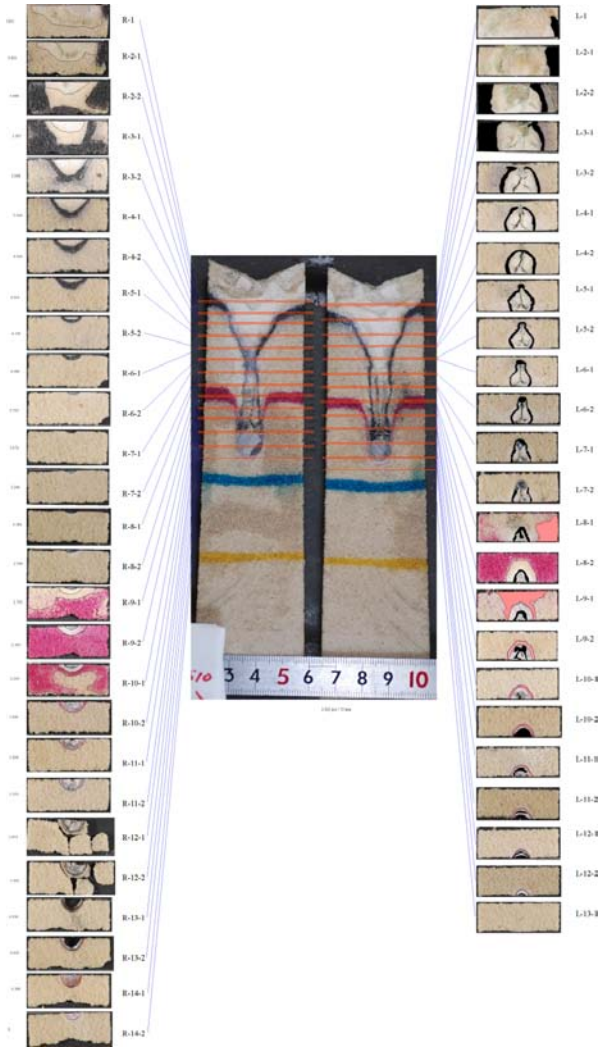
William “Bill” Cooper, PhD
AFRL/RWMW
Munitions Directorate
Air Force Research Laboratory

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Dr. William Cooper, 850-882-7986, william.cooper@eglin.af.mil

Agenda

- Objectives
- Why international?
- Timelines
- Successes

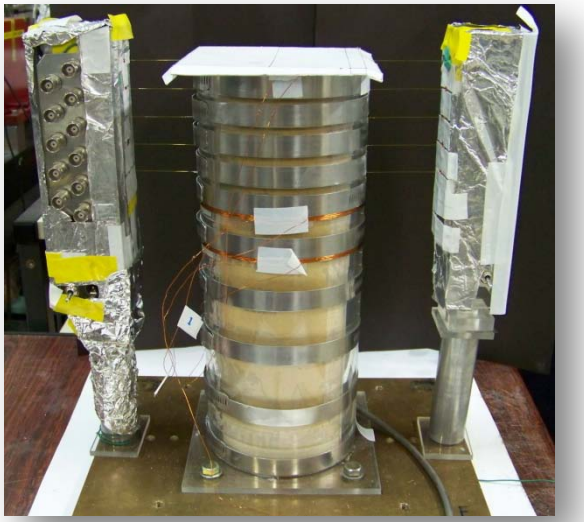




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Objectives

- Develop diagnostics for high-speed impacts with particulate materials
- Leverage world-wide creativity & capabilities
- Learn to think in the way that particulate materials behave
- Shrink the world
- Timeline: 3-year projects administered in 1-Year renewable grants.



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Why International?

- Access to creative thinkers
- Access to unique facilities
- Excellent research value/$ ratio—Large teams for minimal $
- Research immersion & focus time
- Access to Pacific Rim research community

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Payoff

- **By the numbers:**
  - 2 years nearly complete
  - $100K AFRL/RW funds invested
  - $100K AFOSR/AOARD funds invested
  - 2 Senior professors
  - 1 Associate Professor
  - 1 PhD Research Associate
  - 3 M.S. Students
  - 4 Presentations
  - 4 Journal Papers

- **International Exchange:**
  - 3 months in Japan performing research (WoW—AFOSR/IO)
  - Japanese PI visited USA for 3 months at no cost

- **150 page Tech Report:**
  - 2-D Quasi-static Punch Experiment & Analysis
    - Mechanics models (1,2 & 3) for punch loading force
    - Analysis of rate and size effects
  - Model 4: Force Chain Stability Modeling
    - Confining forces PDFs
    - Problems with assuming fixed coefficients of friction
    - Propagation of forces in curved chains w/ friction
    - Special case where inter-granular friction eliminates need for confining forces
      - Estimate of minimum required coefficient of friction
    - Special case of granular contact with rigid surface
      - Estimate of minimum coefficient of friction as function of chain angle relative to wall
  - Dynamic Cylinder Impact Experiments & Analysis
    - Internal shearing layer and friction estimates
    - Observations regarding stability of false nose as function of coefficient of friction behavior
  - Generalized shearing model for granular, crushed material, and solid surface interfaces
  - Dynamic Sphere Impact Experiments & Analysis
    - Impact with glass beads
    - Impact with Eglin sand
    - Internal shearing layer and friction estimates
  - Tohoku University High-Speed Impact Experiment
    - General Techniques
    - Triboluminescent Techniques
    - 3-D Sectioning & Mapping Techniques
  - Osaka University High-Speed Impact Experiment General Techniques
  - New Equipment Designs for Potential Collaborative Experiments
    - Osaka Gun Precision Container Catch Tank
    - Modular Particulate Material Container

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Presentations

Munitions Directorate

砂中への飛翔体高速貫入特性の計測
MEASUREMENT OF HIGH-SPEED PENETRATION PROPERTIES INTO SAND

K. Watanabe[1], K. Tanaka[2], K. Iwane[1], S. Fukuma[1], K. Takayama[3], K. Kobayashi[1]
[1] Osaka University, [2] Chubu University, [3] Tohoku University (E-mail: keikow@me.es.osaka-u.ac.jp)

INTRODUCTION

Background

Collisions between geological materials and rigid bodies occur in various situations, which are excavation, construction, military application and asteroid impact. Accordingly, the impact and penetration of projectiles in soil have long been studied extensively. However, for geological particulate materials such as sand, because the particle behavior is so complicated due to heterogeneity and instability of granular media, there have been few experiments investigating the impulse loading of these media, and the penetration properties on them are less understood.

Dynamics of projectile penetration into sand depends greatly on the features of motion and state of the sand material at the interface with the projectile. Therefore, the goal of this study is to develop an understanding of behavior of projectile during penetration, condition and distribution of comminuted sands and pressure distribution in sand under the impulse loading and then evaluate the influence of impact velocity, initial porosity and particle size on behavior of comminuted sands.

Objectives

- To establish experimental method and data analyzing method.

Investigation Items

- Behavior of ejecta
- Relationship between impact velocity and penetration depth
- Fractured grain and its distribution
- Pressure distribution
- Behavior during penetration (Projectile trajectory, Penetration/ wave speed)

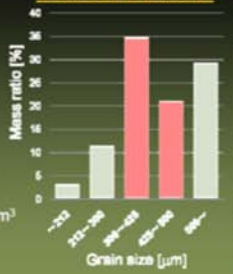
EXPERIMENTAL

Granular Material –Sand–



- Beach sand (Shirarahama sand)
- Silica: >90%
- Density: 2.65x10³ kg/m³
- Washed
- Completely dry

Grain size distribution



Vertical Powder Gun



Powder gun

Bore diameter : ϕ15 mm
Impact velocity: 150~1400 m/s
(Capacity: 100~2000 m/s)

Projectile



Body shape: Cylinder (ϕ15 x 25 mm)
Nose shape: Flat
Material: Impactor; Brass SUS304
Sabot; Polycarbonate
Mass: Brass+Sabot; 12.5 g
SUS+Sabot; 12 g

Target Box

Container A



Material: Polyethylene
Size: 115x155x155mm
Height: 125mm

Container B



Material: PMMA
Inner dia.: 80mm
Thickness: 5mm
Height: 200mm

Container C



Material: PMMA
Inner dia.: 190mm
Thickness: 10mm
Height: 200mm

Packing density : 1.49~1.56x10³ kg/m³
Porosity : 40~43 %



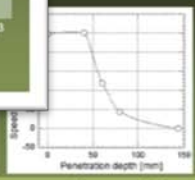
2D pressure distribution of depth direction could be measured and the relationship between pressure and impact velocity was estimated by the pressure measurement sheet.

Fiber

Silica/Silica glass optical fiber
Core diameter: 200μm
Clad diameter: 220μm
(Polyimide jacket is removed by sulfuric acid.)



Glass optical fiber was used to measure the penetration speed of projectile and the slow down history became clear.



SUMMARY

Some methods were proposed and tried for measurement of high-speed penetration properties into sand. As a result, although improvements must be made on many points, the validity of these methods was confirmed.

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Papers

Munitions Directorate

球の砂突入に関する研究

○山本裕朗（医療機器センター）
大谷清伸、早坂庄吉、小川俊宏、高山和喜（東北大学流体科学研究所）

A study of penetration of a sphere into sand layer

Yamamoto Hiroaki, Ohtani Kiyonobu, Hayasaka Shoukichi, Ogawa Toshihiro, Takayama Kazuyoshi
Japan Association for the Advancement of Medical Equipment, 3-42-6 Hongo, Bunkyo-ku, Tokyo, 113-0033 JAPAN

Abstract
Paper reports the result of preliminary tests of a 10 mm diameter sphere penetrating into a sand layer. Using a vertical powder gun, we launched ϕ 10mm stainless spheres at speed ranging from 1.25 km/s to1.94 km/s into sand layers. To preserve impacted specimens, we immersed them into inorganic silicate-sealing agent and succeeded to freeze the trajectory of sphere's motion and to identify the deformation of the sand layer structure.
Key Words: high-speed penetration, sand layer, vertical powder gun, freezing technique

1．はじめに
砂や土のような微小粒状物体が充填された系に高速物体が衝突する現象は、激粒固体の運動ばかりでなく破壊や衝撃剥離などを伴うため、固体、液体、気体などの単相媒体に比べ複雑である。外力が加えられた粉粒体の挙動について、さまざまな実験や理論解析[1]が行われているが、高速物体が砂層への突入する場合のように、高速領域での粉流体の挙動に関する研究は実験的にも解析的にも完了したと言うにはほど遠い。
本報告は超型大薬砲でフロリダ海岸砂を満たした試験槽にステンレス鋼球を 1.25 km/s～1.94 km/s で垂直に打ち込み、高速球の運動と砂層内部構造の変化などを観測する方法を開発する予備実験結果の速報である。

2．実験方法
2－1　供試砂
実験には、フロリダ海岸砂、通称エグリン砂 (Quikrete Commercial grade Fine Sand No.1961) を用いた。図 1 に顕微鏡写真を示す。粒子は主に石英からなり、やや角が取れたいびつな形状を示す。図 2 に粒度分析結果を示す。グラフは縦軸粒度重量比%、横軸粒度 mm の対数表示である。エグリン砂は 335μm から 500μm に極値を持ち、母平均 361μm、母分散 0.733 の正規分布に近い粒径分布を示す。

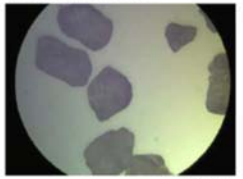


Fig. 1 Eglin sand.

2－2　実験装置
ステンレス鋼球は直径 10mm 重量 6.63g のベアリング球である。図 3 は東北大学流体科学研究所の縦型 1 段式火薬銃であり、過去に高速燃料噴流発生実験に用いた装置を改造した。この回収部に、砂を充填した供試体を置いた。狩猟用ライフルの薬莢に、無煙火薬約 3g を封入し、端末の雷管を空気圧駆動の撃鉄で起爆した。薬室の下部に隔膜を介して、ポリカーボネートのサボに挿入した球を おいた。サボ形状は後端にフレアーをもち、先端はやや鋭めの切り込みをもつ形状で、試行錯誤で最適化されている。なお も工夫の余地があるが、サボは加速管下部に衝突して静止し、爆発生成気体の回収部への流入を阻止し、また、球だけが加速管軸心にほぼ一致することで、回収部への打ち出しを許す形状を持っている。図 3 に衝突して回収されたサボを示す。サボは加速管末端の凹みに、きつく貫入している。

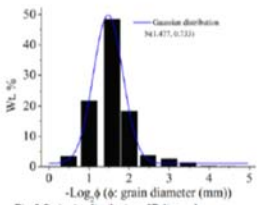


Fig. 2 Grain size distribution of Eglin sand.

サボ分離した球は、1.25k/s から 1.94 km/s で、回収部を自由飛行する。回収部空間には、半導体レーザー光束と受光部を組み合わせ、60mm 間隔に取り付けた飛行時間計測部が配列され、球の速度を推定した。
砂は内径 100mm、長さ 150mm、肉厚 5mm のアクリル被筒円筒に、予備実験なので、特別な配慮なしに充填した。骨材、砂粒径を整えて、振動させながら充填することで砂密度の制御を視野に入れている。

havior Induced by High-Speed Penetration of Projectile

Watanabe*, Koichi Tanaka**, Keisuke Iwane*, Syungo Fukuma*,
Kazuyoshi Takayama*** and Hidetoshi Kobayashi*

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** Department of Mechanical Engineering, Chubu University,
*** Institute of Fluid Science, Tohoku University

primary objective is establishing tangible experimental methods and data
hods in order to grasp various phenomena, which were the behavior of
jectile, the penetration depth and speed of projectile, fractured grains and
istribution, induced by high-speed impact of projectile on sand. The plate
ents were conducted using vertical powder gun. The principal results are
s follows: Sands around the penetrated projectile were smashed to fine
μm or less like a potato starch. Circumferential crashed sands were
buted and generated at impact velocity above 300 m/s. Conical massive
was produced ahead of projectile and vertical angle converged to around
ocity increases. The projectile penetrated at a speed about equal to the
y in the initial penetration and decelerated rapidly over since.

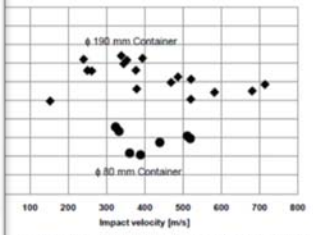
CTON
sions between geological materials and rigid bodies occur in various
ch are excavation, construction, military application and asteroid impact.
he impact and penetration of projectiles in soil have long been studied
However, for geological particulate materials such as sand, because the
ior is so complicated due to heterogeneity and instability of granular
have been few experiments investigating the impulse loading of these
e penetration properties on them are less understood. Dynamics of
tration into sand depends greatly on the features of motion and state of
ial at the interface with the projectile.
inal goal of this study is to develop an understanding of behavior of
ng penetration, condition and distribution of comminuted sands and
bution in sand under the impulse loading. As the first step, the primary
tablishing tangible experimental methods and data analyzing methods in
various phenomena induced by high-speed impact of projectile on sand.

esses by Chains of Grains in High-Speed Particulate Media Impacts

Diagnostics Engineer, Air Force Research Laboratory, AFRL/RWMW,
V. Eglin Blvd Suite 135, Eglin AFB, FL 32542

m x 26 mm) projectiles were fired vertically-downward (150-720 m/s) into acrylic
quartz Eglin sand. Decreasing container size increased projectile drag and decreased
ntainer is within the projectile's event horizon for at least a portion of penetration path
for communication between projectile and container. The particulate media fractured
a rigid, conical false nose on the front face of the projectile, but the fractured media
rojectile diameters of the shot line. Jammed grains (i.e. mechanically-compacted, but
to the fractured media; surrounded by nominally initial-density grains. It is theorized
h the container via stress chains in the un-fractured grains which span the distance
and container wall. The stress chain event horizon may be limited by either mechanical
limited stress wave speeds in the particulate media. This paper focuses upon the
ple analytical models are presented to illustrate how stress chain curvature and friction
ngth and thereby the ability of projectiles to communicate through the particulate media

tanabe 2010] conducted experiments to observe the high-speed impact of right-circular
t face, polycarbonate body) with quartz Eglin sand (ϕ 75-1,400 μm grains, d_{50}=400 μm,
0]. Projectiles were launched vertically downward and impacted the sand surface
t 150-720 m/s. Projectile velocities were measured using induction loops and impact
d photography. Two containers were used: ϕ 80 mm & ϕ 190 mm internal diameter,
epth did not vary appreciably with impact velocity, but was strongly affected by the
ner size from 190 mm to 80 mm cut the penetration depth in half as shown in Fig. 1.
tile communicates with the container--the stresses at the projectile surface and the drag
container size. The goal of this analysis is to examine the mechanics that enable the
ntainer.



Projectile penetration depth as function of impact velocity

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Dr. William Cooper, 850-882-7986, william.cooper@eglin.af.mil

Questions?

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Dr. William Cooper, 850-882-7986, william.cooper@eglin.af.mil

Precision Strike Annual Review – 11

Pacific Region

CAPT Mike Doran

Deputy Chief, Theater Operations
Integration Division

23 February 2011

This Brief is Classified: UNCLASS

Asia-Pacific Region



The Asia-Pacific region encompasses 51% of the Earth's Surface

Mission

U.S. Pacific Command (USPACOM),
together with other U.S. Government agencies,
protects and defends the United States,
its territories, allies, and interests;
alongside allies and partners,
promotes regional security
and deters aggression;
and, if deterrence fails,
is prepared to respond to the full spectrum
of military contingencies
to restore Asia-Pacific stability and security.

Method

1. Synchronize USPACOM actions across the U.S. Government, COCOMs, regional allies and partners

2. Though continual forward presence, enabled by an adaptive regional military posture and enhanced by synergy with capable partners, maintain security of the regional commons

3. Provide conventional and strategic military capabilities for extended deterrence

4. Maintain ready forces and plan, train and exercise to accomplish the full range of military contingencies

Method (cont.)

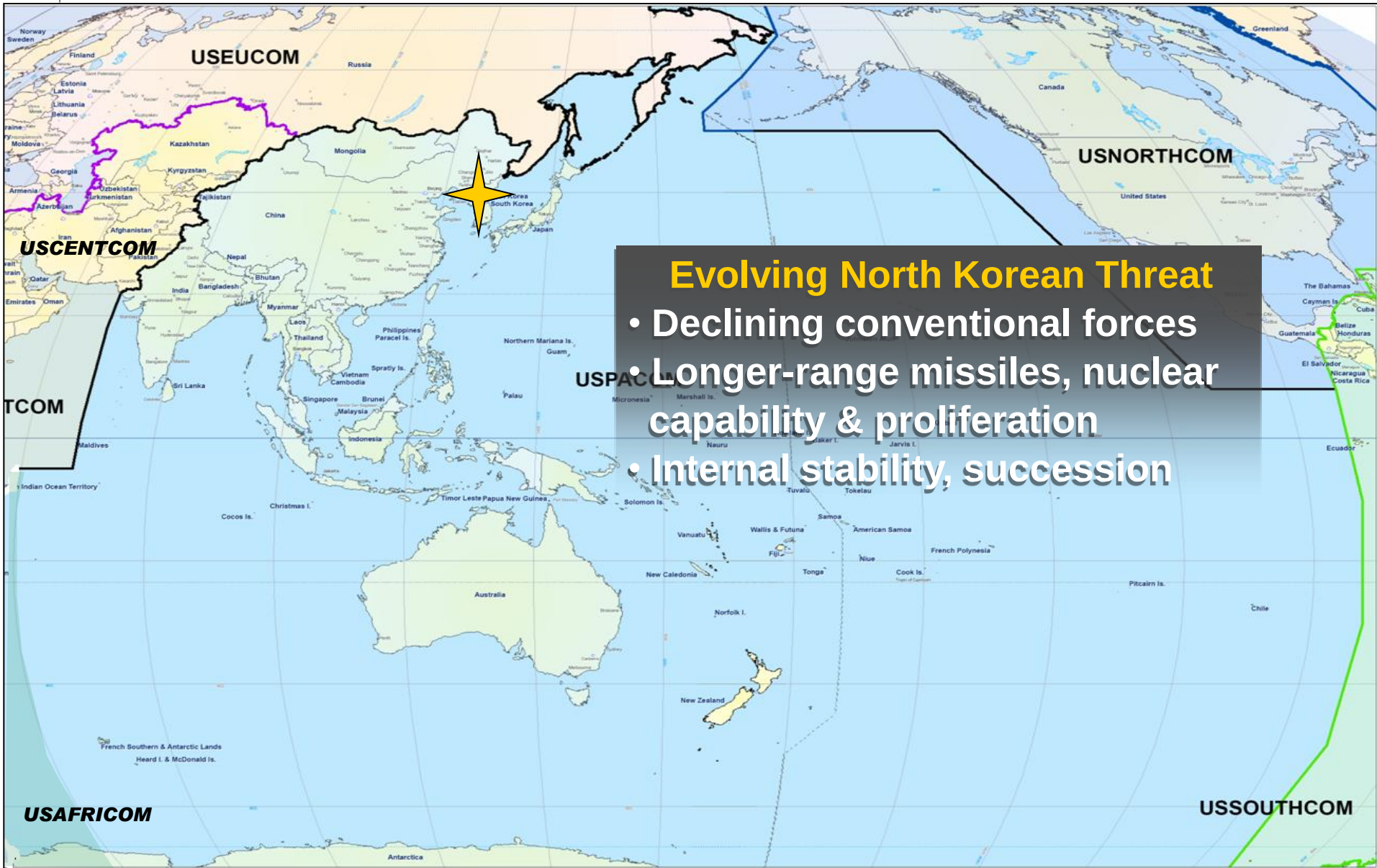
5. In particular, concentrate on five focus areas:

- **Transnational Threats**
- **North Korea**
- **China**
- **India**
- **Allies and Partners**
  - **Australia**
  - **Singapore**
  - **Japan**

Focus Area: Transnational Threats



Focus Area: North Korea



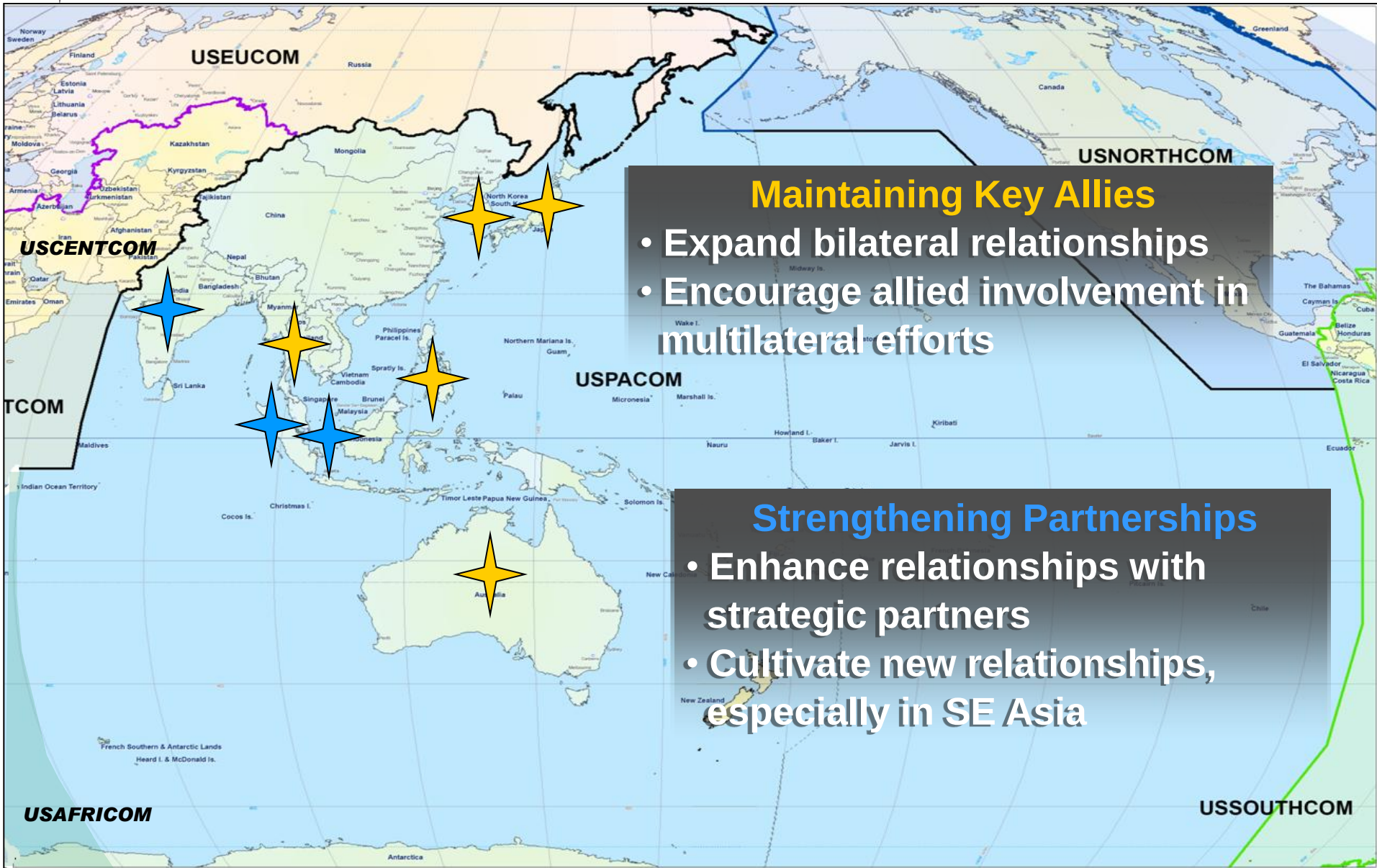
Focus Area: China



Focus Area: India



Focus Area: Allies and Partners



Key Defense Initiatives with Australia

- **Enhanced interoperability of allied forces through:**
  - **Joint military exercises (e.g., Talisman Saber 2011)**
  - **Development of the Joint Combined Training Capability (JCTC)**
  - **Exchanges**

- **Shared intelligence and Intelligence, Surveillance and Reconnaissance (ISR) platforms**
  - **Defense Trade Cooperation Treaty (ratification pend.)**
  - **F/A-18 Super Hornet; C27J Light Cargo Aircraft; MH-60R helicopters; M-777 towed howitzer; Wedgetail Airborne Early Warning and Control aircraft; Joint Strike Fighter**

- **Cooperation on counterterrorism, counterproliferation and HA/DR**

Key Defense Initiatives with Singapore

- **1971 Five Power Defense Arrangement (FPDA)**

- **1990 MOU**
  - **COMLOGWESTPAC (Sembawang)**
  - **Changi Naval Base – carrier pier, Information Fusion Center**

- **2005 Strategic Framework Agreement**

- **Joint Military Exercises**
  - **Commando Sling (USAF, USMC)**
  - **Rim of the Pacific (RIMPAC)**

Key Defense Initiatives with Japan

- **Mutual Defense Assistance Agreement**

- **Treaty of Mutual Cooperation and Security**
  - **Host nation support – $2.2 Billion**
  - **Futenma**

- **Ballistic Missile Defense**
  - **Kongo class DDGs (AEGIS technology)**
  - **Patriot PAC-3**
  - **Co-development of SM-3 missile**

A Dynamic Region – Just in the past year…

- Elections in Japan, Taiwan, Australia, Nepal, Philippines, India, Sri Lanka
- HA/DR – American Samoa (tsunami), Indonesia (earthquake/volcano), Haiti (earthquake)
- Refugee/Ethnic Conflict Issues – Rohingya (Burma/Thailand), Hmong (Laos/Thailand), Uighurs (China/Central Asia), Tamils (Sri Lanka)
- Border/Territory Disputes – Thailand/Cambodia, India/Pakistan, India/China, Spratley Islands, Senkaku Islands
- North Korean Provocations – CheonanSinking, YP Do Shelling
- Insurgencies – India, Thailand, Sri Lanka
- Piracy migration to Indian Ocean

Conclusion

- The Asia-Pacific region is complex; by focusing our efforts we will achieve synergy of action
- By leading credibly, focusing strategically, enabling the warfighter, ensuring Joint and Combined Capability, and aligning with U.S. Government Agencies, we will achieve our mission
- Our desired end state is that the United States, its territories and interests are protected;
  and the Asia-Pacific region is stable and secure

U.S. Pacific Command



This Brief is UNCLASSIFIED

AFRL

THE AIR FORCE RESEARCH LABORATORY

LEAD | DISCOVER | DEVELOP | DELIVER

Precision Strike Annual Review 2011

Weapons Science & Technology Investment Areas

23 February 2011

Colonel Ken Echternacht

Director, Munitions Directorate

Air Force Research Laboratory

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A Stroll Through Weapon Technology



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Outline

- US Air Force Mission
- AFRL Mission & Focus
- Munitions Directorate
- Core Technical Competencies
- Capability Planning
- Collaborations
- Summary

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USAF Mission

The mission of the United States Air Force is to fly, fight, and win…

in

Air, Space, and Cyberspace



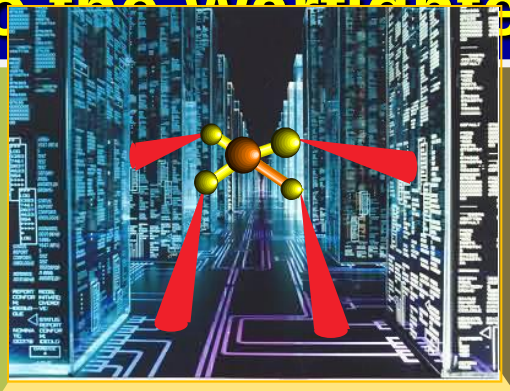
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USAF S&T Vision

The mission of the United States Air Force is to fly, fight and win… in Air, Space and Cyberspace

Unparalleled Support to the Warfighter







Guides USAF S&T goals

Cyber

Links S&T to Warfighter

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Air Force Research Laboratory Mission



Leading the **discovery**, development, and integration of **affordable** warfighting technologies for our air, space and cyberspace force.

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AFRL Organization

Commander (CC)
Maj Gen Ellen Pawlikowski

Executive Director (CA)
Mr. Joe Sciabica

Vice Commander (CV)
Col Daniel Morin

Chief Technology Officer (CZ)
Dr. Morley Stone


AFOSR


Propulsion
(RZ)


Directed Energy
(RD)


Information
(RI)


711th Human
Performance Wing


Munitions
(RW)


Sensors
(RY)


Space Vehicles
(RV)


Materials &
Manufacturing (RX)


Air Vehicles
(RB)

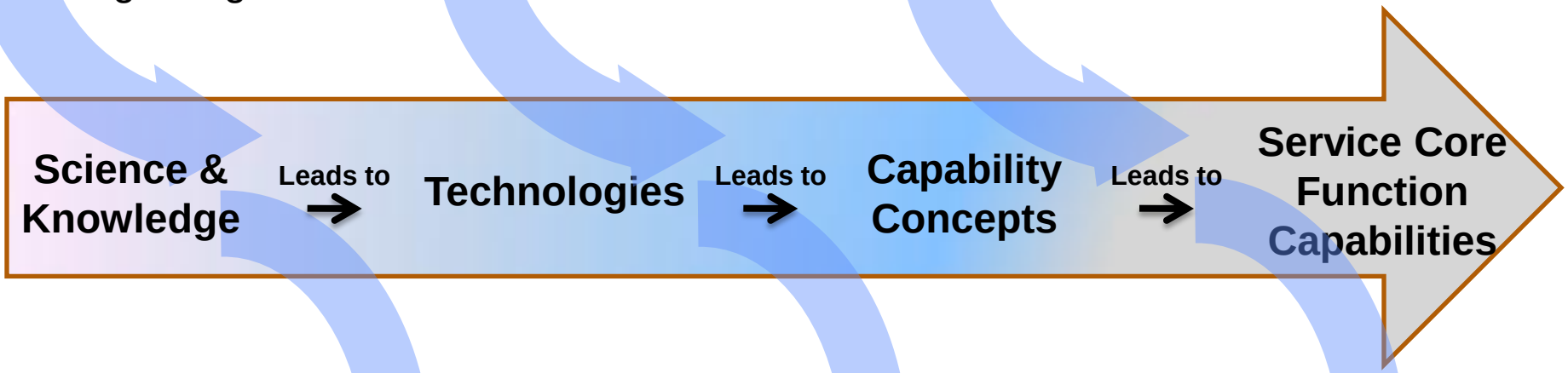

Human
Effectiveness
(RH)

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AF S&T
Turning Science into Capabilities

- Air Force Strategy
- OPsCs, CRRA, CFMPs
- Air Force S&T Strategy
- Technology Horizons
- Wargaming

\+ Center Needs + MAJCOM Needs



Outputs:
- New Technologies
- "The realm of the possible…"
- Tech Transfer/Some Tech Transition

Outputs:
- Mature Technologies
- New Capability Concepts
- Tech Transfer/Tech Transition

Outputs:
- Mature Capability Concepts
- Tech Transfer
- Tech Transition

Timeline:
IOC >25 years | IOC > 10 years | IOC >5 years | IOC >1 year

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Capability Concepts

- **Warfighter Capability Based on Projected Performance Of Technology**
  - Built Up from Projects In Multiple Directorates but Often Driven by One Technology Area
  - Some in Response to Specific MAJCOM Need
  - Some Generated from Science Identifying the “Realm of the Possible”
- **Three Types Of Capability Concepts**
  - Flagship Capability Concepts (Goal 6-8) – AF-Level Designation, Our Top Priority for Transition
  - Capability Concepts (Goal 50-60) – Clearly Defined Warfighting Capability with MAJCOM Interest But Transition not Secured
  - Planning Capability Concepts (Goal~80) – Good Ideas and Concepts but not Mature or Well Enough Defined Yet
- **Flagship Capability Concepts**
  - Championed by a User, Preferably with Transition Money Identified
  - Designated by the CSAF/SECAF, Vetted Through the AF Corporate Process
  - Rigorous Systems Engineering Applied
  - Funded & Baseline Controlled at the HQ AFRL Level

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DEFENSE THREAT REDUCTION AGENCY



AFRL MUNITIONS



AIR ARMAMENT CENTER



AFOTEC Det 2



53rd WING



20th SPCS





JOINT FIRES INTEGRATION AND INTEROPERABILITY TEAM



NAVY EOD SCHOOL

COAST GUARD



ARMY RANGERS



ARMY 7th SFG



AFSOC (919th and 1st SOW)



33rd WING



10

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AFRL Munitions Directorate



Vision:

Precision Engagement….

Delivering Desired Effects

Mission:

Lead the discovery, development, integration, and transition of affordable precision engagement technologies for our air, space, and cyberspace force

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AFRL / RW – *Value to the Warfighter*

- **We stay *constantly engaged* and responsive to evolving challenges and opportunities**
- **We support both the *current fight and the future Air Force***
- **We take a very disciplined approach to *prioritizing our portfolio***
- **We deliver the most *cost effective S&T* regardless of source**
- **We have a sustained track record of successful *transitions***







Relevant & Innovative ... Rapid & Responsive

Transition *Vision, Knowledge & Products*

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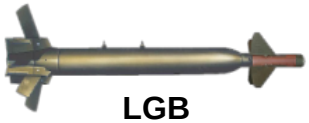
Ongoing and Upcoming Challenges

- **Enabling our Next Generation Delivery and Strike Platforms …**
  - Next Generation Missile
  - Next Generation Penetrator
  - Long Range Strike
  - Small and Selectable Effects Weapons
  - Directed Energy
- **Sustaining our Legacy Weapons and Platforms …**
- **Leading the Way in the Discovery of Game Changing Science and Technologies**

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Capability Transition / Delivery

Legacy



LGB



BLU-121



AMRAAM



Shredder ATD



GBU-28 “Bunker Buster”



Crash-Pad



JDAM



PAW



JASSM



MOAB



HTSF



FLM

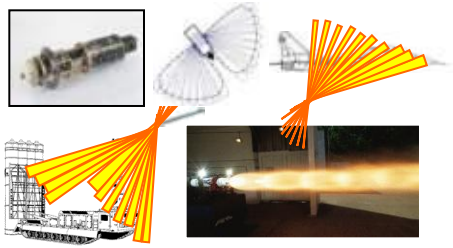


SDB I



BATCAM

Future



A-A Superiority
SEAD / DEAD &
Electronic Attack



Long Range / Intra-Theater Strike



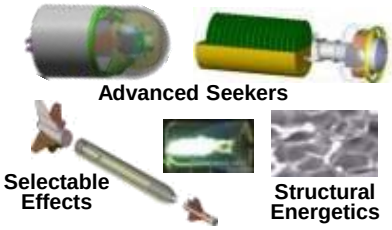
Long Range Strike



Close Controlled
Strike & Special Ops



Micro-Weapons for
Novel target Effects



Intra-Theater / Close
Controlled Strike

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Core Technical Competencies
Investment Areas



Damage Mechanisms



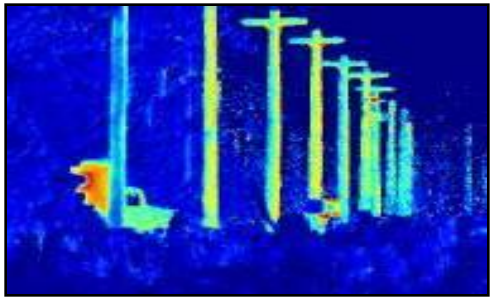
Fuze Technologies



Energetic Materials



Munitions Integration & Demo



Munitions Aero, GN&C



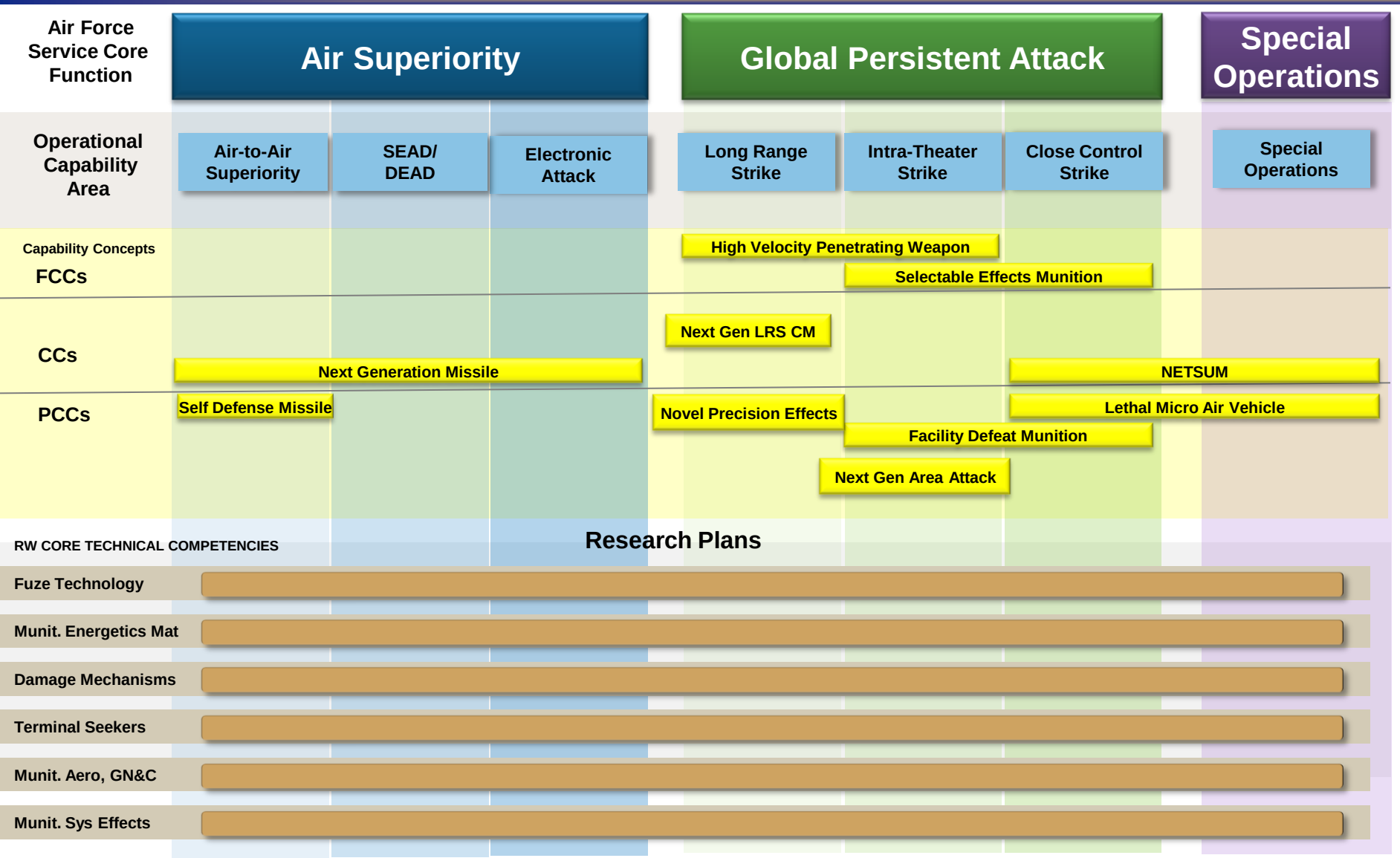
Munitions Systems Effects



Terminal Seekers

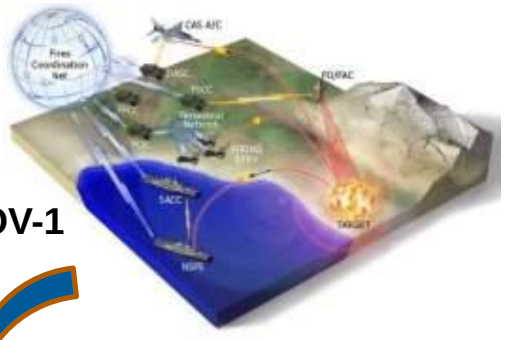
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Mapping Capability Concepts & CTCs to the AF Mission

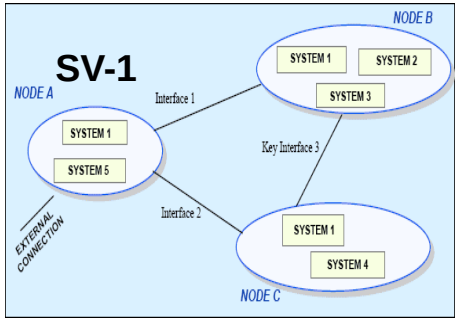


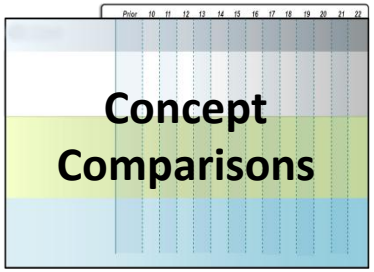
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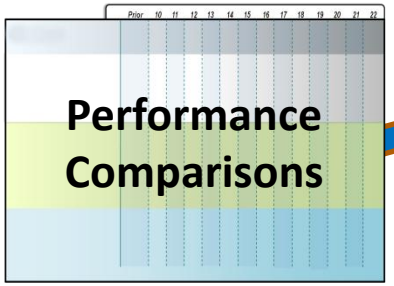
Capability Development Planning

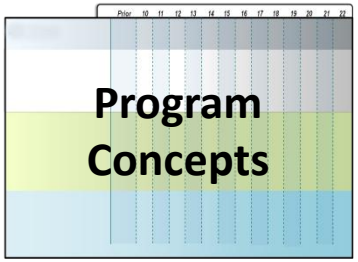


OV-1





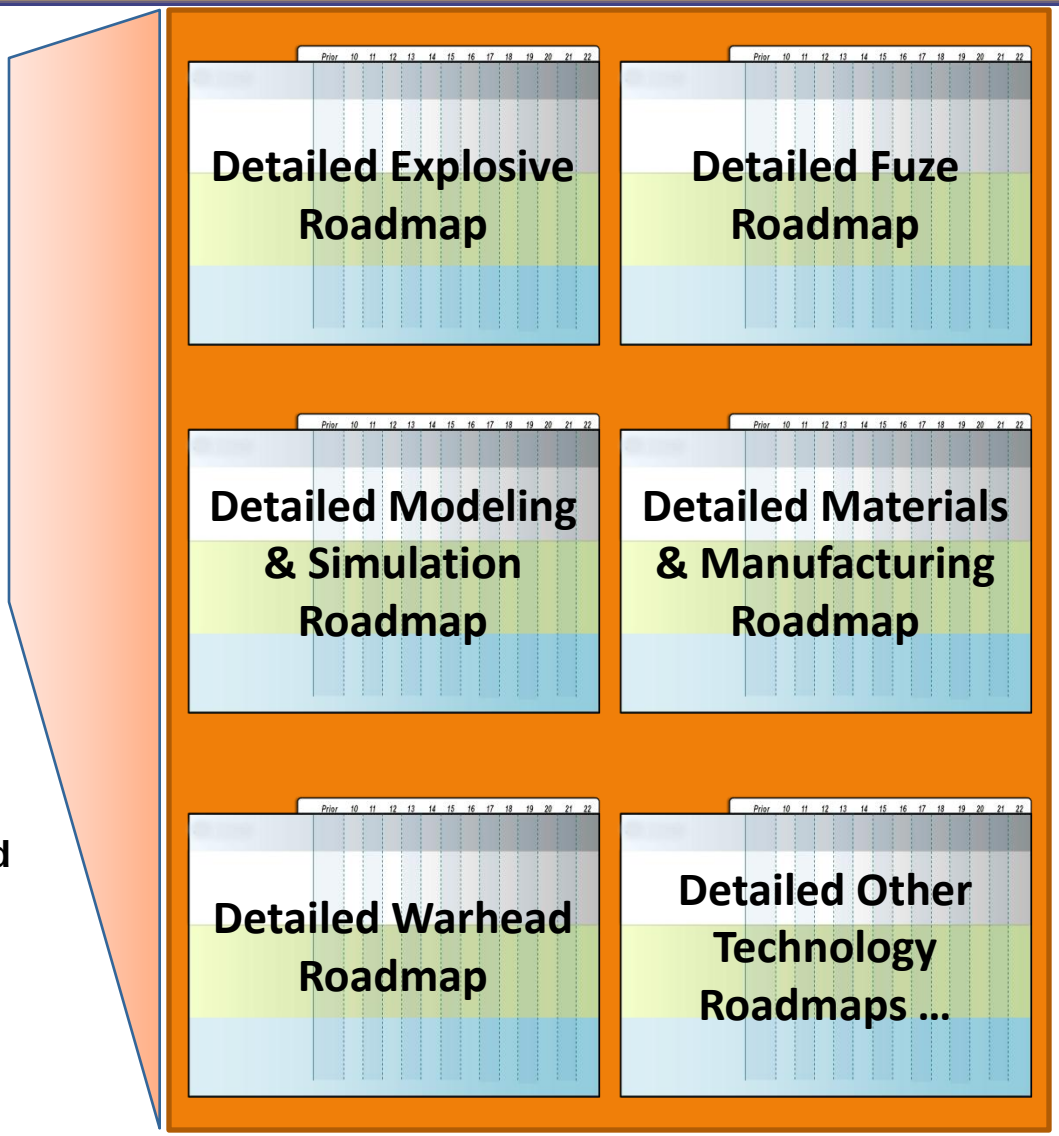




- Operational Capability Area (OCA) lead oversees the OCA for RW
- OCA Integrated Product Team (IPT) reviews gaps and needed weapon attributes
- OCA IPT develops concept trade space including rough cost & schedule estimates
- Stakeholder meetings/analyses
- Capability Concept Refinement
- Re-Engage Munitions Stakeholders
- Develop and coordinate collaborative roadmap

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Capabilities to Technical Challenges & Approaches



- Increase fidelity of technical challenges that have to be overcome to enable concept - down to sub-component area (Research Plan)
- Estimate program cost & schedule based on desired maturation dates
- Re-Engage Munitions Stakeholders
- Allocate Available Resources
- Update Research Plans & Roadmaps
- Execute Work Units

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Munitions Directorate Collaboration



Dept of Defense



International





Industry



Academic

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AFRL/RW Industry Partnerships

Title	Company	Technology Challenge
Development of a Penetration Shock Accelerometer Data Acquisition / Decision Making Module	Kaman Aerospace Corporation	Munitions Systems Effects
Demonstration of Active Millimeter Wave Radar Technology	UBC Inc	Munitions Aero, GN&C
Quint Networking Technology (QNT)	Lockheed Martin Corporation	Terminal Seekers
2-Color Ambient IR Scene Projection System	Lockheed Martin Corporation	Munitions Aero, GN&C
RDT&E of Communication and Networking	L-3 Interstate Electronics Corporation	Terminal Seekers
KDI ESAF Sled Test	KDI Precision Products Inc	Fuze Technologies
RDT&E of Communication and Networking Technologies	Rockwell Collins Inc	Terminal Seekers
RDT&E of GPS and Navigation Technologies	L-3 Interstate Electronics Corporation	Munitions Aero, GN&C
MMW Seeker Technology	Lockheed Martin Corporation	Terminal Seekers

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AFRL/RW Industry Partnerships (Cont.)

Title	Company	Technology Challenge
Millimeter Wave Advanced Search and Strike (MASS)	Raytheon Missile Systems	Terminal Seekers
Air Launched Hit to Kill Modeling and Simulation Kill Chain Analysis	Raytheon Missile Systems Air Armament Center (AAC/XR)	Munitions Systems Effects
Structural Energetic Technology Development	Boeing Company	Energetic Materials
Moving Target Strike (MTS)	General Atomics Aeronautical Systems	Munitions Aero, GN&C
Tri-Mode Seeker Technology	Lockheed Martin Corporation	Terminal Seekers

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AFRL/RW Academia Partnerships

Title	Academia	Technology Challenge
OASIS 512 Array Test and Packaging	John Hopkins University	Munitions Aero, GN&C
NODDS PACE Development	MIT	Munitions Aero, GN&C

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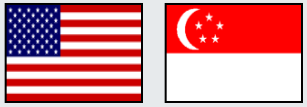
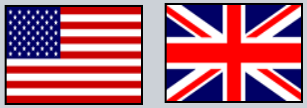
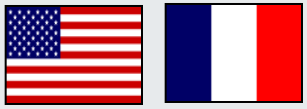
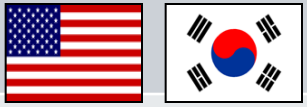
AFRL/RW SBIRs

Title	Firms Involved	Technology Challenge
GPS Degraded and/or Denied Precision Navigation for Munitions	Nu Trek, California Physical Optics Corporation, California	Guidance and Avionics Control
Hypervelocity Aerodynamic Interaction of Ballistic Bodies (AIBB)	CFD Research Corporation, Alabama Kord Technologies, Alabama	Aerodynamics Sciences
Cumulative Structural Damage from Multiple Weapons	Karagozian and Case, California	Fixed Target Lethality
Navigation and Orientation Determination Advanced Research and Development	Microcosm, Inc. California ImSAR, LLC, Utah	Guidance and Avionics Control
Predicting Structural Debris and Secondary Air Blast	Karagozian and Case, California ACTA, Inc. California	Fixed Target Lethality
Strapdown Wide-Field-of-Vie (WFOV) Closed Loop Guidance	Cyan Systems, California Spectral Imaging Laboratory, California	Seeker Sciences
Munitions Effects on Building Infrastructure Components	ACTA, California Baker Engineering and Risk Consultants, Texas	Fixed Target Lethality
Innovative Micro-munition Electrical Interface Physical Interconnection Alternatives	WINTEC, Inc. Florida Luna Innovations Inc. Virginia	Aerodynamics Sciences
Layered Sensing Bio-Signatures for Dismount Tracking	Toyon Research Corp, California Photon-X, Inc, Alabama	Seeker Sciences

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AFRL/RW International Partnerships

Title	Countries Involved	Technology Challenge
(TTCP) WPN AG-25 (Weapon Action Group 25)	 US, Canada, Australia, UK, New Zealand	Mapping Current Weapon Technologies to find areas of Mutual Interest
Seeker Performance and Design Environment (SPADE)	US & Australia 	Guidance
Insensitive High Explosives for High Speed Penetrators	US & Germany 	Explosive Materials
Synthesis, Formulation & Characterization of Structural Nanoenergetics	US & Singapore 	Explosive Materials
Compact Penetrating Weapon Technologies Covering the Attack & Defeat of Hardened Targets	US & UK 	Energetic Materials
Mutual Weapons Development Master Data Exchange Agreement	US & France 	Models & Vulnerabilities
Conventional Munitions	US & S. Korea 	Warhead Design, Fuzing, Explosive, Modeling & Sim
Measurement of HS Penetration into Sand	US & Japan 	Diagnostics Development for High-Speed Particulate Media Impacts
Image Gyro for Airborne Applications	US & Japan 	Guidance

Summary

- **Munitions technology investment gives high ROI**

- **Mid term munitions outlook characterized by**
  - Increased lethality (per munition and airframe)
  - Persistence
  - Smaller Weapons potential for UAVs
  - Network centric / Cooperative control
  - Low Collateral Damage

- **AFRL/RW relies on partnering to achieve our mission**
  - Growing Revolutionary Technology Initiatives

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AFRL Munitions Directorate



http://www.eglin.af.mil/units/afrlmunitionsdirectorate

We Deliver the Warfighter's Best Bang for the Buck !!

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USSOCOM

Acquisition at the Tip of the Spear



Mr. James "Hondo" Geurts

Deputy Director for Acquisition

United States Special Operations Command

A Unique Organization



A Combatant Command with Legislated Military Department Like Authorities

WHICH OF THESE IS SPECIAL OPS?

















SOF Acquisition Challenge



No fail mission – provide effective, wide-ranging, time-sensitive capabilities to our widely dispersed and often isolated special operations forces

Acquisition Enterprise

DOD and Service Labs, Industry IR&D



Service Acquisition



SOF Acquisition

- Combat Feedback
- Unconventional Uses





- SOF-to-Service Transition
- Innovative Acq Practices



Unconventional Needs Demand Unconventional Approaches

- One-size fits all processes, workforce, and approach will not meet the rapid and unconventional equipping need
- Success requires the purposeful cultivation of acquisition entrepreneurs at all levels
- Culture vs. process is the largest enabler for rapid acquisition
- Today's reality: Industry, SOCOM, and Service teams must leverage each other instead of competing

Acquisition Principles

- Deliver capability to the User expeditiously
- Exploit proven techniques and methods
- Keep Warfighters involved throughout the process
- Take Risk and Manage It!

"We pursue technologies. They are not necessarily the most advanced, but the most useful." ADM Eric T. Olson

SORDAC Organization

- Commander
  - Acquisition Executive
    - Deputy
    - Military Deputy
      - Resources & Analysis
      - Science & Technology
      - Comptroller
      - Procurement
      - PEO Maritime
      - PEO Rotary Wing
      - PEO C4
      - JATF
      - PEO Fixed Wing
      - PEO SOF Warrior
      - PEO SRSE
      - PEO SOFSA



SOF Acquirers



Integrity Courage Creativity Competence

Operationally oriented, professionally trained and certified, experts in SOF unique acquisition processes

"Leading the Revolution" A Blueprint for SOF Acquisition?

1. Set unreasonable expectations
2. Execute an elastic business definition
3. A cause, not a business
4. Embrace and listen to new voices
5. Enable a market for innovation
6. Exploit low-risk experimentation
7. Create cellular division
8. Connectivity at all levels

*USSOCOM acquisition ... light, agile, lethal: a pathfinder for DoD acquisition reform: USSOCOM leads the way by focusing on modifying organization culture rather than processes. Glenda H. Scheiner

*Leading the Revolution - Gary Hamel

FY10 SOF Acquisition

EQUIPPING THE WARFIGHTER



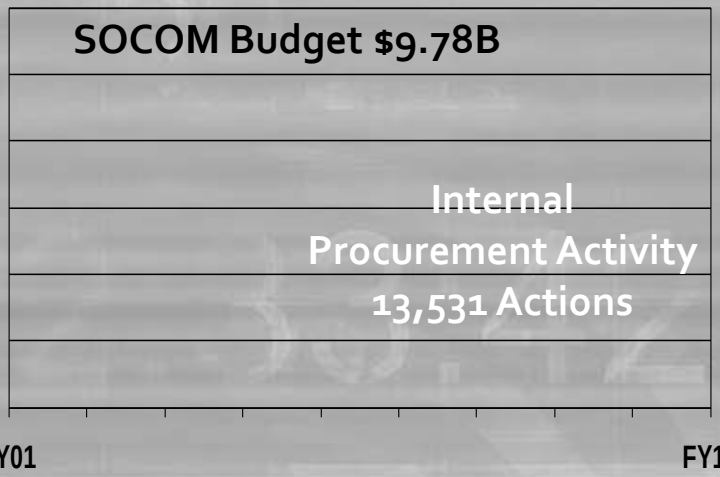
- 30+ Fixed & Rotary Wing Craft Systems
- 100+ Vehicles
- 1800+ Weapons Systems
- 7600+ C4I Systems
- 600+ ISR Kits
- 9.7M ammunition

INNOVATION



- Project Dragon Spear
- Mobile Tech Repair Centers
- Solar Panels in FOBs
- Hand Held Laser Markers
- Manned/Unmanned ISR

WORKLOAD



SOF ACQUISITION TEAM



Accelerating the Force



- Combat Evaluations
- Less Bureaucracy
- Lower Collateral Damage
- Faster
- Global Access
- More Interoperable
- Greater Reuse
- Partner Nation Transferable
- Easier to Train/Use
- More Precise
- More Adaptable
- More Supportable

PROJECT Dragon Spear



- Requirement: Rapidly Field a Multi-Mission Day/Night Precision Strike and Mobility Capability to Support Deployed SOF Teams
- Augmented Existing Mobility Aircraft Capabilities (MC-130W) with Combat Proven Modular ISR and Precision Strike Packages
- Meets immediate combat needs while enabling rapid and affordable AC-130J recapitalization program


UNITED STATES
SPECIAL OPERATIONS COMMAND

Agile Acquisition

Project Dragon Spear

CY	2009	2010

CMNS







6 Modified Aircraft

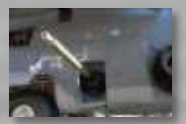


USSOCOM Standoff Precision Guided Munition (SOPGM)

Production Prototype

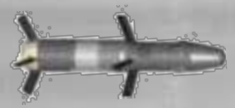








Precision Strike Package



USSOCOM Munitions/Battle Mgmt Software Provided to USMC Harvest Hawk



8 Aircraft Delivered in 15 Months from Funding


Dragon 1- 25 Mar 2010


Dragon 2- 28 Apr 2010


Dragon 3- 1 Jul 2010


Dragon 4- 31 Jul 2010

PROJECT DRAGON SPEAR
MULTI-MISSION...ASS KICKIN


Dragon 5 – 30 Aug 2010


Dragon 6- 10 Nov 2010


Dragon 7- 14 Dec 2010


Dragon 8- 21 Dec 2010

USSOCOM Stand-off Precision Guided Munition

- Family of light weight, day/night, standoff, low collateral damage, precision weapons for discrete kinetic effects
  - Developed/tested/fielded in months vice years
  - Uses USSOCOM common launch tube and government developed battle management suite (hardware and software)
  - Airborne (forward and rearward firing) and Ground Variants
- Interest in emerging warhead, seeker, and alternative munitions



USSOCOM Needs/Interests in Airborne Armaments

- Improved PGM options for UAS (all sizes)
- Novel employment methods
- Lethal UAS and other unconventional technologies
- Medium caliber gun technologies, improved ammo, etc
- Improved Find/Fix/Track/Targeting in all environments
- ***Key Attributes***
  - Speed to field
  - Easily integrated into existing/future capabilities
  - Applicable in multiple mission areas
  - Reliable, employable, supportable, affordable

USSOCOM Needs In Non-traditional Armaments

- Improved non-lethal capabilities (airborne and ground)
  - Vehicle stopping
  - Personnel
  - Warning and fratricide avoidance

- ***Key Attributes***
  - Speed to field
  - Easily integrated into existing/future capabilities
  - Ease of training
  - Rapid escalation to lethal if needed

SOF Truths
SOF Acquisition Truths

FAST *does not equal* UNDISCIPLINED

Humans are more important than hardware

MORE BUREAUCRACY *does not ensure a* BETTER PRODUCT

RISK *must be* MANAGED NOT AVOIDED

Quality is better than quantity

FASTER *does not have to increase* COST/RISK

Special Operations Forces cannot be mass produced

COMPETITION *can be done* QUICKLY

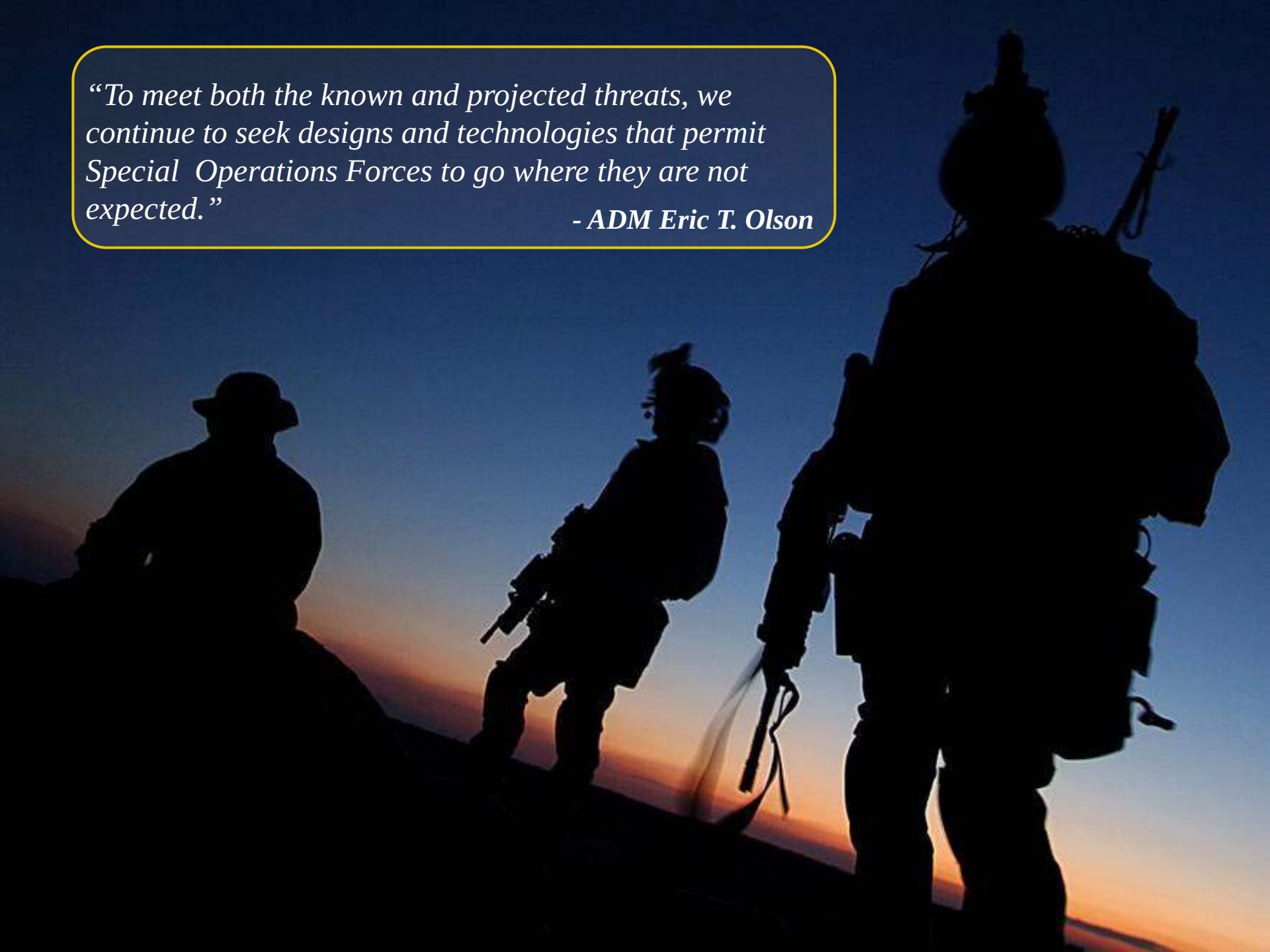
Competent Special Operations Forces cannot be created after emergencies occur

UNCONVENTIONAL THINKING *is an* ENABLER

CREDIBILITY AND TRANSPARENCY *enable* FREEDOM OF ACTION

Most special operations require non-SOF support




“To meet both the known and projected threats, we continue to seek designs and technologies that permit Special Operations Forces to go where they are not expected.”
- ADM Eric T. Olson

Presentation by Dr. Peter R. Huessy,
President, GeoStrategic Analysis and
Senior Defense Consultant,
National Defense University Foundation

Precision Strike Association,

February 23-24, Ft. Walton Beach, Florida:

“Middle East Prospects, Oil and Missiles, Defense Threats, and US Defense Spending”

Outline

- I. The Middle East: Some History, Roots of Terrorism, New Emerging Threats….
- II. Ballistic Missiles…Proliferation and US Response
- Precision Guided Weapons…role in counter terrorism
- III. Cars to China to OPEC to Terrorists…US Energy Policy

PART 1: The Middle East

- Some History…
- Terrorist Roots…
- Linking Geography, Military Technology, Demography and Social Networking
- Some Precision Strike Lessons….

A Reminder of the Roots of Terrorism

- According to the Soviet Roots of Terrorism:
- "The PLO was dreamt up by the KGB, which had a penchant for "liberation" organizations. There was the National *Liberation* Army of Bolivia, created by the KGB in 1964 with help from Ernesto "Che" Guevara. Then there was the National *Liberation* Army of Colombia, created by the KGB in 1965 with help from Fidel Castro, which was soon deeply involved in kidnappings, hijackings, bombings and guerrilla warfare. In later years the KGB also created the Democratic Front for the *Liberation* of Palestine, which carried out numerous bombing attacks on the "Palestinian territories" occupied by Israel, and the "Secret Army for *Liberation* of Armenia," created by the KGB in 1975, which organized numerous bombing attacks against US airline offices in Western Europe."

Terrorist States Yesterday and Today…

- The major state sponsors of terror are Iran, Syria, Libya, Saudi Arabia, Yemen, Somalia…financing, sanctuary, training, arming
- Afghanistan under the Taliban and Iraq under Saddam primary state sponsors of terrorism
- Their affiliated terrorist groups include Hamas, Hezbollah, the Taliban, Abu Sayef, Al Qaeda, Islamic Jihad, FARC….

The Shrinking Geography…

- One force that is shrinking the map of Eurasia is technology, particularly the military applications of it and the rising power it confers on states. In the early Cold War, Asian militaries were mostly lumbering, heavy forces whose primary purpose was national consolidation. They focused inward. But as national wealth accumulated and the computer revolution took hold, Asian militaries from the oil-rich Middle East to the tiger economies of the Pacific developed full-fledged, military-civilian postindustrial complexes, with missiles and fiber optics and satellite phones. These states also became bureaucratically more cohesive, allowing their militaries to focus outward, toward other states. Geography in Eurasia, rather than a cushion, was becoming a prison from which there was no escape. (Kaplan, The Revenge of Geography, 2009)

Begin With Destructive Arsenals: Ballistic Missiles

- Now there is an “unbroken belt of countries,” from Iran to North Korea, **which are developing ballistic missiles and destructive arsenals.** A map of these countries’ missile ranges shows a series of overlapping circles: Not only is no one safe, but a 1914-style chain reaction leading to wider war is easily conceivable. **“The spread of missiles and weapons of mass destruction in Asia is like the** spread of the six-shooter in the American Old West,” Yale professor Bracken writes—a cheap, deadly equalizer of states.

- Ballistic Missiles allow rogue and state sponsors of terror to intimidate and influence regime behavior throughout the heartland…..

Add Population Growth….

- The other force driving the revenge of geography is population growth, which makes the map of Eurasia more claustrophobic still….
- Egypt's 40 million people of 1977 is now 83 million people just as Pakistan's 75 million is now 180 million
- Each country had USAID programs of "family planning" which means if you are going to have catastrophic levels of population you might as well plan to do so on purpose….

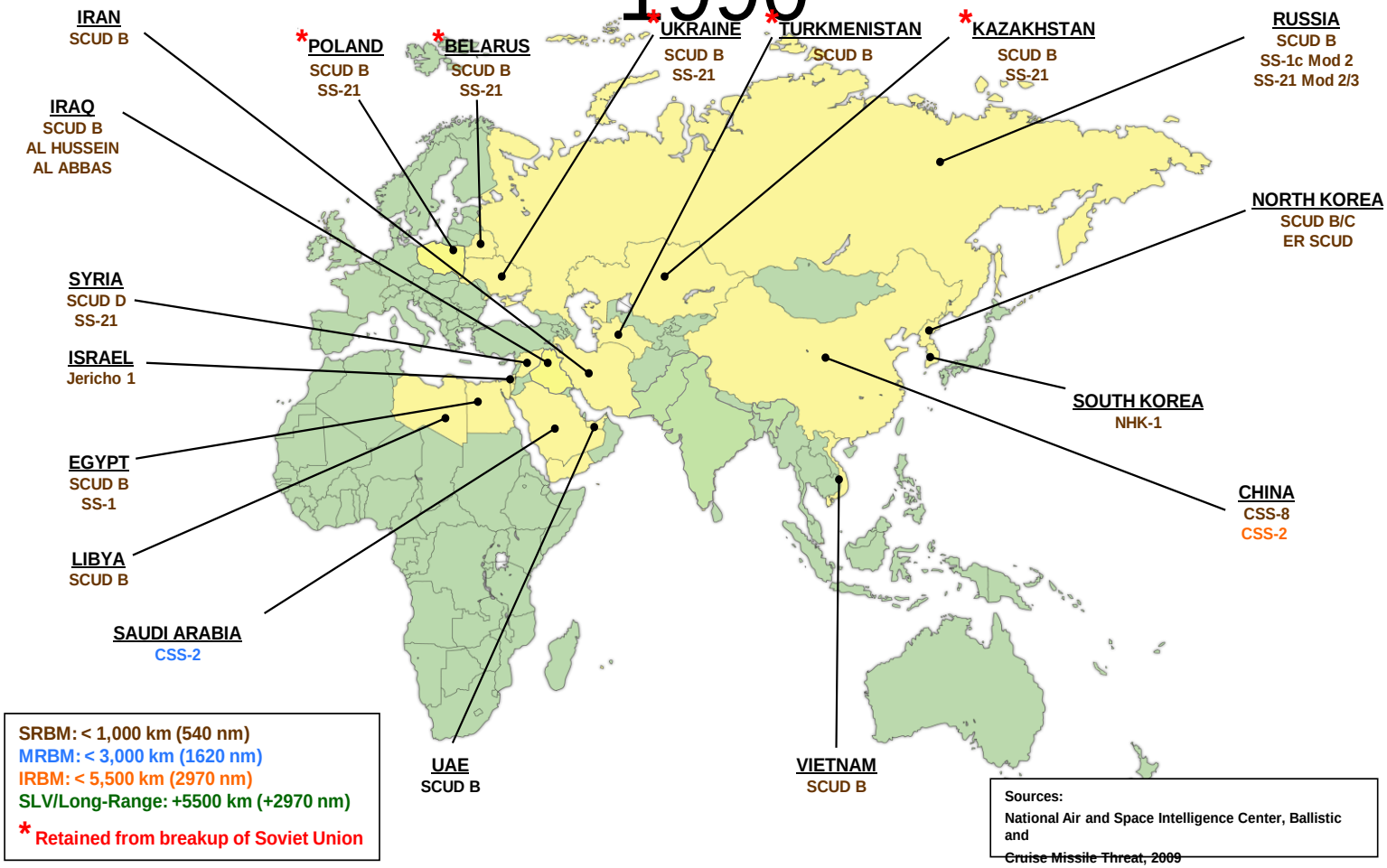
Add Social Networks Technology…Stir and Presto….

- Eurasia of vast urban areas, overlapping missile ranges, and sensational media will be one of constantly enraged crowds, fed by rumors transported at the speed of light from one Third World megalopolis to another…
- It is in the cities of Eurasia principally where crowd psychology will have its greatest geopolitical impact. Alas, ideas do matter. And it is the very compression of geography that will provide optimum breeding grounds for dangerous ideologies and channels for them to spread.
  Kaplan, The Revenge of Geography, 2009

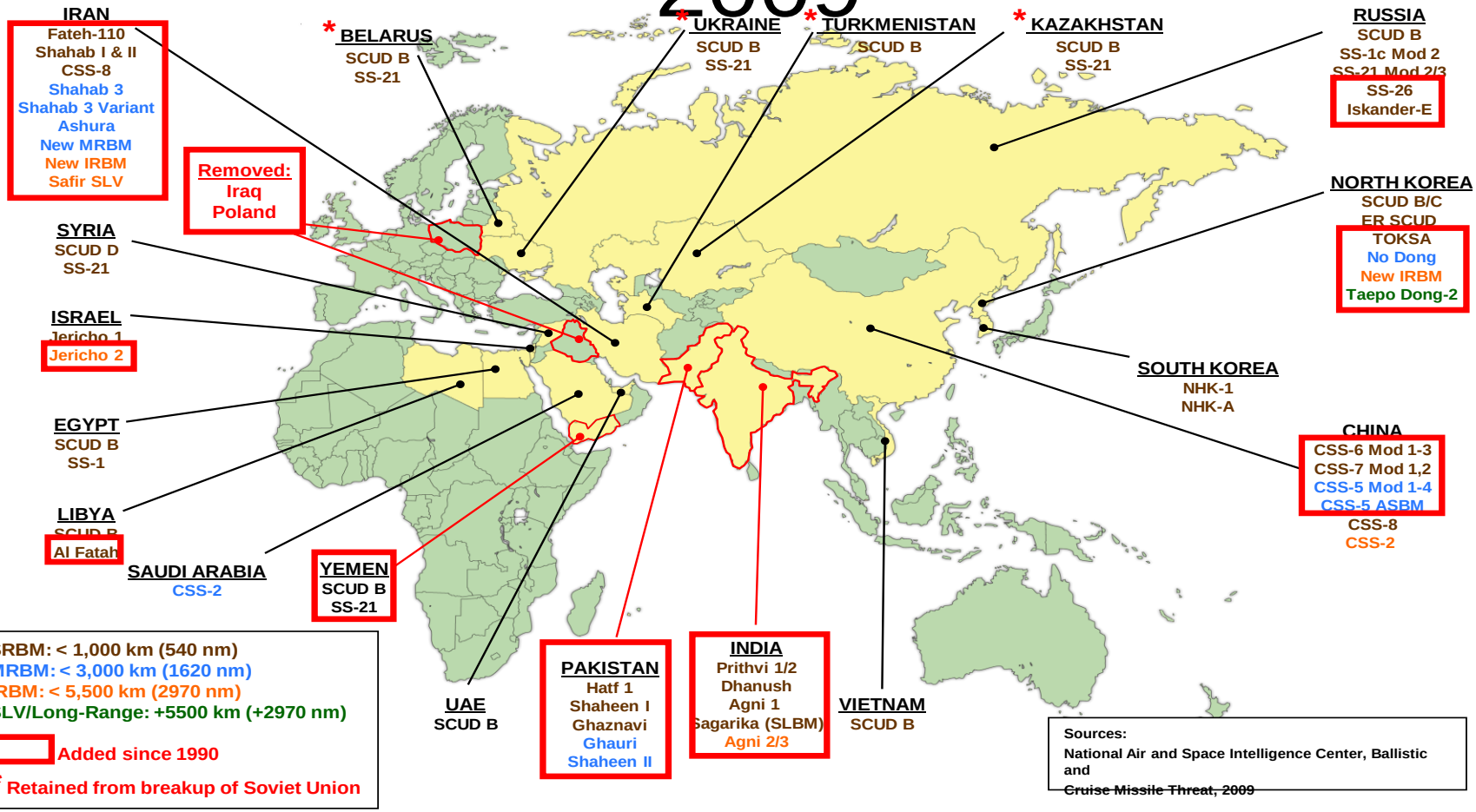
Part 2

- Ballistic Missile Threats….
- US Response
- EMP and Grid Protection…

Ballistic Missile Proliferation: 1990



Ballistic Missile Proliferation: 2009



EMP Missile Threats

- 1998 Iran tests of EMP type missile launch in the Caspian....“World without America”
- Rumsfeld Report says EMP highest threat
- US Congressional EMP Commission report
- 300-400 K of US Coast, detonated at 70-120k altitude. Everything from Atlanta to New York shuts-down…

US Response

- Grid Protection Act Passed House unanimously in 2010….
- HR 668 Introduced by Congressman Trent Franks in 2011…
- Cost of $400 million or $1.33 per America, or 1/1000th of your utility bill of $400 billion annually, or 44cents per month per family, all 12,000 transformers protected….

PART 3: Energy Policy: From Dependence to Independence

- Part III: Energy Implications of Mid-East Turmoil…
- Energy Realities
- Energy Solutions…
- Open or Flexible Fuel Standard
- Leader: Congressman Roscoe Bartlett

Energy Prospects

- IEA World Energy Outlook 2010
- Executive Summary
- Excerpts:

- **“Crude oil output reaches an undulating plateau of around 68-69 mb/d by 2020, but never regains its all-time peak of 70 mb/d reached in 2006.”**

Energy Prospects

- **“Crude oil output reaches an undulating plateau of around 68-69 mb/d by 2020, but never regains its all-time peak of 70 mb/d reached in 2006.”**
- **“Total OPEC production rises** continually through to 2035 in the New Policies Scenario. **The increasing share of OPEC contributes to the growing dominance of national oil companies: as a group, they account for all of the net increase in global production between 2009 and 2035.”**

Energy Money Flows

- United States motorists, truckers and air passengers borrow $474 billion a year from the Chinese…
- We send the money overseas to OPEC and non-OEPC oil producers…
- Iran, Venezuela, Russia, Libya are state sponsors of terrorism, use the funds to sustain, train and arm terrorists…
- This is equivalent to 90% of what we now spend on the base Defense Department Budget**
- **Which is what we will talk about tomorrow!

Oil Shocks & US Recessions

- The oil shock of 2008 didn't just throw 5 million Americans out of work, it made many of them default on their home payments, and thus destroyed the value of the mortgage-backed securities held by America's banks…
- This, in turn, threatened a general collapse of the financial system, with a bailout bill for $1.6 trillion sent to the taxpayers as a result.
- Now oil is again at $100 a barrel, and Iran, the current president of OPEC, has already announced that it has no intention of convening the cartel a minute before oil reaches $120.

More ME and Energy

- Almost 80% of conventional world oil reserves are controlled by the oil cartel OPEC. Three quarters of world oil reserves are in countries in which radical Islam is on the rise.
- What insanity to allow automakers to, in effect, collude with the OPEC oil cartel, by not opening the 12 million new vehicles that annually roll onto US roads to fuel competition.
- Every one of those cars has an average street life of seventeen years, which means that the minute it leaves the lot, we are extending our vulnerability to the world's petrocracies by two more decades.
- The US is blessed with huge reserves of coal, natural gas and biomass but the gasoline-only car does not permit any of those to compete. It drinks only oil. (Gal Luft, "Oil Isn't Cocoa", Big Peace, February 22, 2011)

Flex or Open Fuel Vehicle Standard

- Legislation in Congress would establish an open fuel standard to allow any mixture of gasoline, ethanol, methanol, or diesel to be used in any automobile sold in America
- China now supplies 9% of its transportation fuel fro methanol
- Brazil gets 96% of its transportation fuel from non-petroleum sources—US car companies sell cars to Brazil that are required to have an open fuel standard
- Flex fuel mod cost $70 per car or less than $2 per month over three years.

Alternatives…Choice….

- This is why Congress' top priority should be to shield the economy from upcoming oil shocks. The simplest way of doing so is to open the fuel market to competition by requiring that new automobiles are able to run on other fuels in addition to gasoline. The current global spot for the alcohol fuel methanol made from natural gas is $1.28 per gallon, without any subsidy, equivalent in energy terms to gasoline at $2.33 per gallon. Methanol from coal is also very economic. Indeed, there are fuels that are not only cheaper than gasoline on a per mile comparison but can also be made from America's domestic resources. Why shouldn't our cars be able to run on them? (Gal Luft, Big Peace, February 22, 2011)

The Defense Budget: Prospects and Realities

- Part I: Some Assumptions….
- Part II: Some Spending Alternatives (30% of the Budget)
- Part III: Some Perspectives

Total Revenue Assumptions

Individual income taxes	899	956	1,145	1,339
Corporation income taxes	191	198	327	397
Social Security payroll taxes	632	559	660	732

Total Revenue Increase Assumptions, FY10-13

- ***FY10: $2,163 billion***
- ***FY11: $2,174 billion +9$B***
- ***FY12: $2,609 billion +$435***
- ***FY13: $2,959 billion +$350***

- The Previous record increase in annual revenue to the US Government was $225billion in 1998-9 and 2005-6
-

Spending Impasse: Issues

- **House Passed CR Spends $61 Billion Less Than Last Year, $99.6 Billion Less Than President Requested…**
- **But, FY11 proposed spending by administration is $200+billion more than FY08**
- **HR1 is $96 billion more than FY08 but $100 billion less than FY11**
-

Total Discretionary Spending Trends

- **Total Spending:**
- **FY08: $932.8 Billion**
- **FY10: $1,089.8 Billion**
- **FY11: $1,128.1 (Proposed by Administration)**
- **FY11 $1028.5 (Alternative Proposed by House)**

Defense and Non-Defense $

- *This is -$99.6B FY11 vs. FY11, -$61B FY11 vs. FY10; and +$96B FY11 vs. FY08.*
- *BY COMPARISON, DEFENSE SPENDING PROPOSED BY HR#1 FOR FY11 IS +$8 BILLION MORE THAN FY10 and $57 billion more than FY08.*

Projected Defense Spending

FY	Strategic Forces	General Purpose Forces	C3 Intel & Space	Mobility Forces	Guard & Reserve Forces	Research & Development	Central Supply	Training Medical & Other	Admin & Assoc.	Support & Other Nation	Special Ops Forces	Undist.	Total
2000	6 ,927	102,680	33,637	11,797	23,275	27,819	20,030	47,594	8,406	987	3,683	122	286,958
2001	6, 800	114,178	36,820	10,918	24,802	30,060	18,753	51,816	9,057	783	3,070	3	307,060
2002	8,239	125,054	40,021	14,100	26,483	35,772	20,827	56,134	22,399	1,259	5,024	66	355,378
2003	8,162	173,523	56,173	16,401	29,898	40,236	26,273	62,191	11,440	1,968	6,758		433,024
2004	8,795	183,138	58,160	14,693	30,013	45,595	26,931	64,033	15,639	2,756	6,511	-213	456,052
2005	9,025	197,639	63,602	16,680	30,671	50,017	26,133	63,489	29,269	9,777	6,424	-249	502,476
2006	9,737	219,981	69,648	18,270	35,657	52,580	28,692	75,764	10,024	7,759	8,301	-141	536,272
2007	10,027	263,320	74,873	19,637	38,862	55,033	25,717	68,687	20,310	17,117	10,908	-620	603,872
2008	10,683	299,231	84,115	22,883	40,952	54,091	30,347	72,646	32,115	9,963	12,252	2,776	672,055
2009	9,827	289,538	88,232	19,470	40,125	54,916	27,780	83,560	29,654	10,508	12,251		665,861
2010	12,619	283,036	89,366	16,275	42,081	53,169	30,591	83,699	29,099	12,218	12,218	783	665,154
2011	11,083	214,253	83,944	12,705	41,473	48,156	23,934	84,023	16,611	2,358	10,361	192	549,093
2012	10,736	219,313	87,157	12,672	41,315	49,205	26,594	87,662	17,982	2,313	11,392		566,341
2013	10,390	228,186	85,116	14,189	42,666	48,887	27,205	90,416	19,140	2,298	13,267		581,760
2014	10,883	234,926	86,906	15,622	44,134	46,825	28,127	92,890	20,941	2,426	14,071	-1	597,750
2015	12,457	241,852	88,996	16,222	45,862	45,046	29,445	96,322	21,446	2,546	15,822		616,016

More Budget Numbers

- *But in FY08, defense was 49% of discretionary spending but by 2011 got 29% of the increase of $196 billion in overall discretionary spending proposed by the administration**

- *Numbers taken from HAC Press Release of February 18, 2011*

Summary and Conclusions

- 1. The potent combination of geography, population growth, missile technology proliferation and social networks…
- 2. Defend against geographic reach of missiles and deploy missile defenses…to reduce leverage and coercion of state sponsors of terror
- 3. Acquire precision-guided systems that have shown great promise in Gaza, Lebanon, Afghanistan and Iraq….to help deal with nation-state sponsored terrorism
- 4. Adopt Grid Protection Against EMP Attack….
- 5. Adopt Open Fuel Standard to Introduce Energy Choice, to remove the cash flow to the terrorist sponsoring exchequer…





INSENSITIVE HIGH EXPLOSIVES FOR HIGH SPEED PENETRATORS

Precision Strike Association Annual Review
23 February 2011

Jennifer L. Jordan, Ph.D.
Branch Technical Advisor
Lt Ross Stanley
Program Manager
Energetic Materials Branch
Munitions Directorate
Air Force Research Laboratory

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Overview

- Project Objectives
- Challenges
- Project Agreement (PA) Status
- Roadmap

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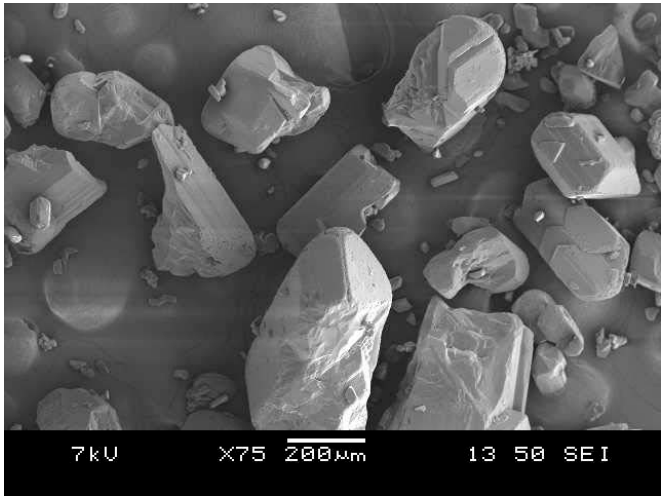
Project Objective

- Understand the changes in high explosives (HE) due to loading during hard target impact
- Develop an experimental characterization protocol for understanding structural changes and senstivity correlations in HE
- Enhance the modeling and simulation capabilities to capture the damage-sensitivity correlations in HE

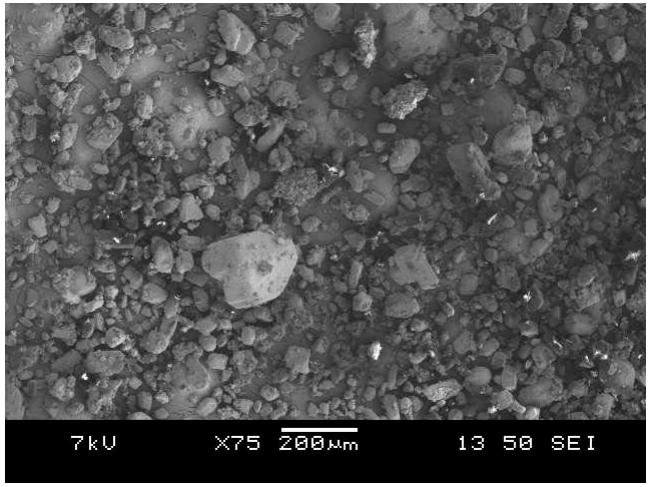
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Challenges

- **Develop a characterization protocol, including modeling and simulaton, for damaging and quantifying the effects of damage in HE**
- **Quantifying the microstructure associated with pristine and damaged HE**
- **Perform sub-scale tests on HE to validate protocol and models**



HE Crystals prior to Mixing

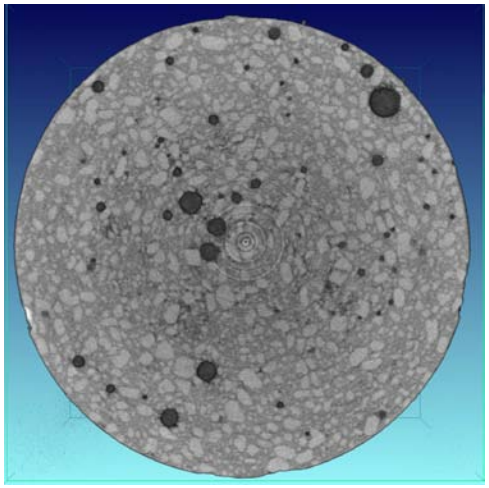


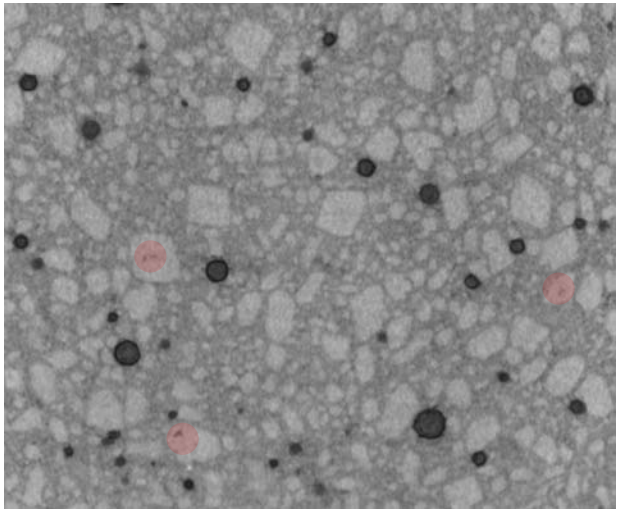
HE Crystals Post Mixing

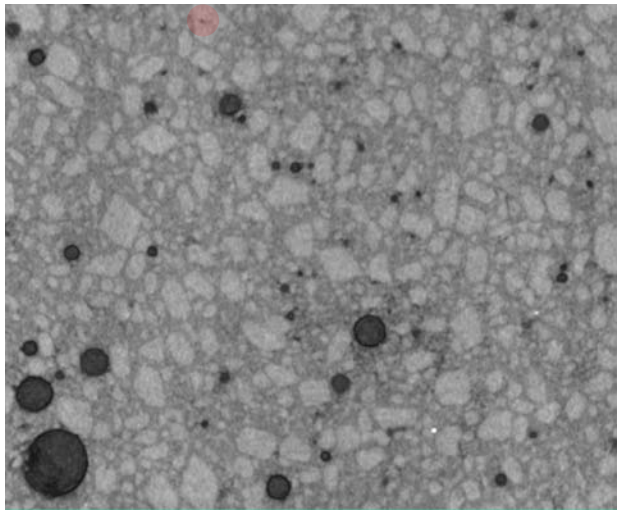
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Status of the Project Agreement

- PA has been in progress for one year.
- Testing of representative HE materials is underway.
- Next interchange meeting is May 2011.







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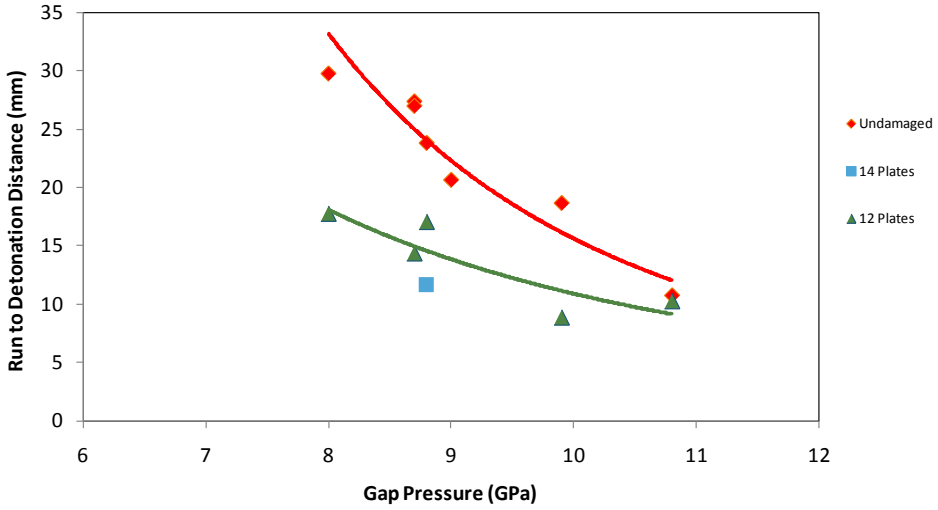
Roadmap

- Numerical analysis of loading conditions – complete
- Support of test design by numerical simulation – complete
- Selection of mechanical and thermal loading methods – complete
- Laboratory experiments with defined HE samples – underway
- Microstructural analysis and sensitivity tests – underway
- Numerical simulation of laboratory experiments – underway
- Numerical simulation of detonation process
- Correlation of thermo-mechanical loading with structural changes
- Correlation of micro-mechanical changes with changes in sensitivity
- Sub-scale impact tests

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Summary

- **Project Objectives / Challenges**
- **Project Agreement (PA) Status – PA underway**
- **Roadmap**
  - Technical progress being made on characterizing HE and supporting modeling and simulation



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Headquarters Air Combat Command

Air Force Targeting Center

Precision Strike Annual Review

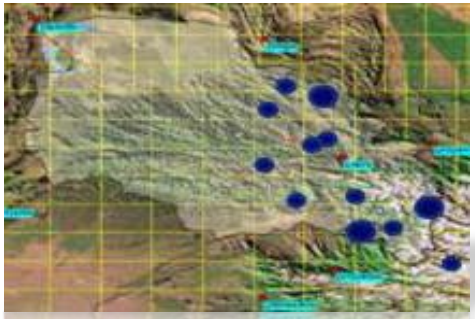
Lt Col Matt Johnson
36IS/CC
23 Feb 2011

This Briefing is:
UNCLASSIFIED

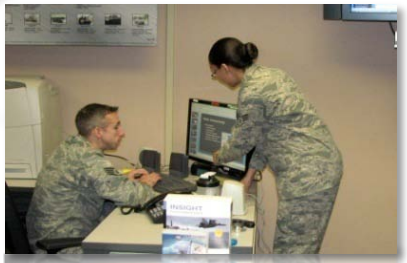
Purpose

- **Update AFTC progress & efforts since Oct 2010 brief**
- **Highlight recent work supporting CENTCOM**

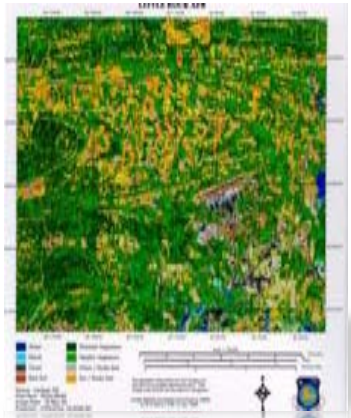
Air Force Targeting Center Mission



Target Analysis & Production



All Source Analysis



GEOINT



Unit Support



Training

Mission Statement:

Provide targeting and geospatial products and services, expertise and advocacy to Air Force and Joint Warfighters

Organization

C-MAJCOM

C-NAF

AOC

HQ AFTC
Langley AFB, VA



Operations Directorate

Mission Support Directorate

20 IS
Offutt AFB, NE

36 IS
Langley AFB, VA

Classic Assoc Unit

15 IS
Langley AFB, VA

194 IS (WA ANG)
Camp Murray, WA

236 IS (TN ANG)
Nashville, TN

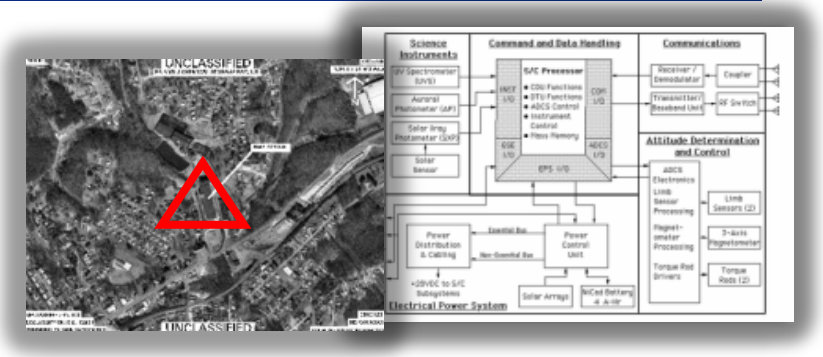
150 IS (NM ANG)
Kirtland AFB, NM

Charter & Resulting Support

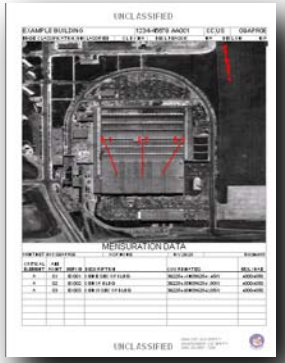
- **Specific areas of AFTC chartered to address:**
  - **Support Air Operations Centers (AOC) & Theater Air Control System (TACS)**
    - ***AFTC is currently providing direct support to 5 AOCs***
  - **Target system analysis**
    - ***AFTC Targeting and Effects Studies (TES); 1 complete, 4 underway***
  - **Electronic target folders**
    - ***Actively producing/revalidating portions of ETFs***
  - **Precise point mensuration (PPM) for Coordinate Seeking Weapons (CSW)**
    - ***Actively providing; also providing training & certification***
  - **Targeting expertise**
    - ***Provide personnel forward & reach-back capabilities***
  - **Integration and synchronization of kinetic and non-kinetic capabilities**
    - ***Expanding our training and engagement in this area***

A Day in the Life…
AFTC work supporting CENTCOM units

- **Targeting and Effects Study (TES) for AFCENT**

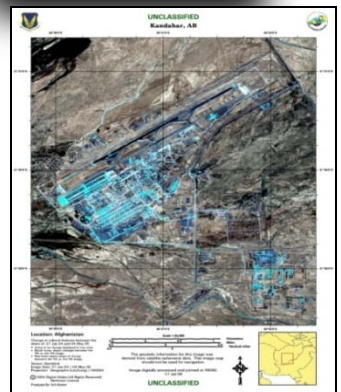


- **Producing Terminal Area Models (TAMs) for JASSM as well as CALCM planning/graphics; developing over 700 aimpoints currently**





- **Creating training & target materials: Range imagery, dropzone graphics, CIB, & Combat ID materials**





CENTCOM Support (Cont.)

- Developing and revalidating portions of target folders; over 100 just completed for AFCENT; weaponeering for HAF/A9 study



- CDE training; recently trained 5 AFCENT personnel
- Precision Point Mensuration training & certification; AFCENT recently had 7 trained and 9 certified
- Assessing unit level intel effectiveness



- Deploy personnel

Challenges

- **Establishing enterprise management of growing AFTC**
  - **Analytical processes and production management**
  - **Planning and programming**
  - **Training (formal and ancillary)**
  - **Personnel, security, facility management**
  - **System engineering, design and maintenance**
  - **Operational architecture development**

- **Rapidly expanding customer requirements calling for:**
  - **Senior analytical support to combat NAFs and AOCs**
  - **Advocacy in Service and Joint forums**
  - **Deliberate and crisis action planning**
  - ***Development of "Habitual Relationships"***

- **CENTCOM challenges (but not CENTCOM-specific)**
  - **Target development standards**
  - **CDE training/certification**
  - **Program access and special weapon support**

Questions & Discussion





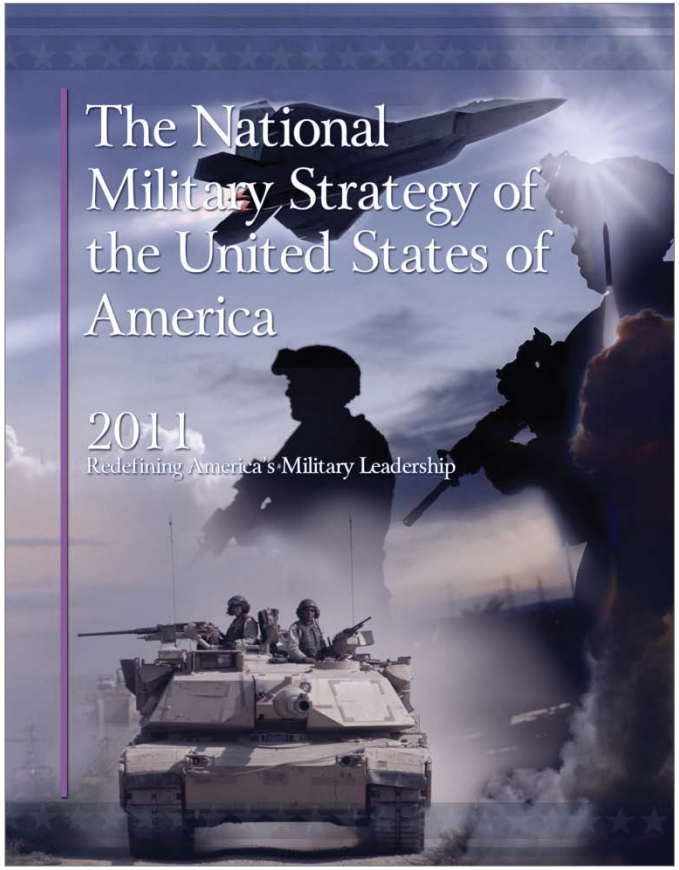
AFTC on SIPRNet:
http://aftc.langley.af.smil.mil

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CENTCOM AOR

- Widespread unrest and discontent with political leadership
- Fueled by religion, economics and demands for social reforms
- Exacerbated by Facebook, Twitter, other internet social media
- US strategic interests include oil, the Suez Canal, promotion of democracy and access to established and emerging markets
- Bahrain:
  - Shiite majority ruled by Sunni minority
  - Sheikh Hamad bin Isa Al Khalifa (1999) has promoted democratic reforms but feelings of underrepresentation exist
- Egypt:
  - Political and economic apathy
  - Corruption, poverty and unemployment
- UAE:
  - Oil rich, politically stable
  - "Wall Street" of the Middle East
- Jordan:
  - Stable but not immune from economic and employment trends
  - Upside down private – public sector funding (roughly 80% of budget pays public employees)

The 2011 National Military Strategy



Briefing to the Precision Strike Association

RDML John Roberti

23 February 2011

The Overall Classification of the Briefing is UNCLASSIFIED

Agenda

- **NATIONAL MILITARY STRATEGY**
  - **Codified Requirements**
  - **NMS Structure**
  - **Strategic Direction: NSS, QDR & NMS**
  - **Purpose and Vision**
  - **Strategic Environment**
  - **Achieving Our National Military Objectives**
  - **Military Objectives**
    - **Counter Violent Extremism**
    - **Deter and Defeat Aggression**
    - **Strengthen Global Regional Security**
    - **Shape the Future Force**



Codified NMS Requirements

Title 10 U.S.C. 153(d):

- **Biennial Review of NMS NLT 15 Feb of even numbered years.**
- **Delineation of a national military strategy consistent with:**
  - **(i) The most recent National Security Strategy**
  - **(ii) The most recent annual report of the SECDEF to the President and Congress.**
  - **(iii) The most recent QDR conducted by the SECDEF.**
- **Description of strategic environment, opportunities and challenges.**
- **Description of regional threats to U.S. interests.**
- **Description of international threats posed by terrorism, WMD, and asymmetric challenges.**
- **Identification of National Military Objectives and their relationship to strategic environment, regional, and international threats.**
- **Identification of the strategy, underlying concepts, and component elements to achieve mil objectives.**
- **Assessment of capabilities and adequacy of U.S. forces.**
- **Assessment of capabilities, adequacy, and interoperability of regional allies/other friendly nations to support the U.S.**
- **Assessment of nature and magnitude of strategic and military risk.**

Assessment

Ends

Ways

Means

Risk

NMS Structure

- CJCS Opening Statement (Purpose and Vision)
- Introduction
  - Thesis: The complexity of this global system and the challenges therein demand that we – the Joint Force – think anew about how we lead.
  - Approach: Our military employs a number of approaches that characterize our leadership – facilitator, enabler, convener, and guarantor.



- Strategic Environment
- Enduring National Interests & Military Objectives
  - Counter Violent Extremism
  - Deter and Defeat Aggression
  - Strengthen International & Regional Security
  - Shape the Future Force
- Conclusion

Links Between NSS, QDR and NMS

NSS

Security	International Order	Prosperity	Values
The security of the U.S., its citizens, and U.S. allies and partners	An international order advanced by U.S. leadership that promotes peace, security, and opportunity through stronger cooperation to meet global challenges	A strong, innovative, and growing U.S. economy in an open international economic system that promotes opportunity and prosperity	Respect for universal values at home and around the world

QDR

Prevail in Today's Wars	Prevent & Deter Conflict	Prepare to Defeat Adversaries and Succeed in a Wide Range of Contingencies	Preserve and Enhance the All-Volunteer Force

NMS

Counter Violent Extremism

- Succeed in South Central Asia
- Whole-of-Nation approach to counterterrorism
- Build Partner Capacity
- Adapt deterrence principles to counter extremist
- Apply military power with other instruments

Deter and Defeat Aggression

- Maintain strategic deterrent capabilities
- Counter WMD proliferation
- Maintain a robust conventional deterrent
- Project power globally
- Counter anti-access and area denial strategies
- Assured access to commons

Strengthen International and Regional Security

- Globally available yet regionally focused
- Defend Homeland
- Increase in interest and priorities in Asia-Pacific
- Leverage "convening power"
- Foster security cooperation

Shape the Future Force

- Focus on Our People
- Improve Our Capabilities and Readiness

Purpose and Vision of the NMS

Purpose

- Provide the ways and means by which our military will advance our enduring national interests as articulated in the *2010 National Security Strategy* and to accomplish the defense objectives in the *Quadrennial Defense Review* Report
- The Goldwater-Nichols Reorganization Act of 1986 charges the Chairman of the Joint Chiefs of Staff with the responsibility of assisting the President and Secretary of Defense in providing strategic direction for the Armed Forces

Vision

- A Joint Force that provides the military capability to defend our Nation and allies, and to advance broader peace, security, and prosperity
- Military power is most effective when employed in support and in concert with other elements of power as part of whole-of-nation approaches to foreign policy
- Meet the expectations of the American people that their military reflects the best of this great Nation at home and abroad

What challenges and trends will drive our decisions?

Strategic Environment

- **Demographic Trends – world will become more populated and urbanized**
- **Prosperity and Security – growing regional power and resource competition**
- **Weapons of Mass Destruction – Challenge of WMD armed states still developing stable political systems, aggressive states such as Iran and North Korea seeking nuclear weapons**
- **Global Commons – Assured access and freedom of movement being challenged by state and non-state actors**
- **Non-State actors – State sponsored and non-state actors extending their reach through the use of technologies to coordinate and operate globally**

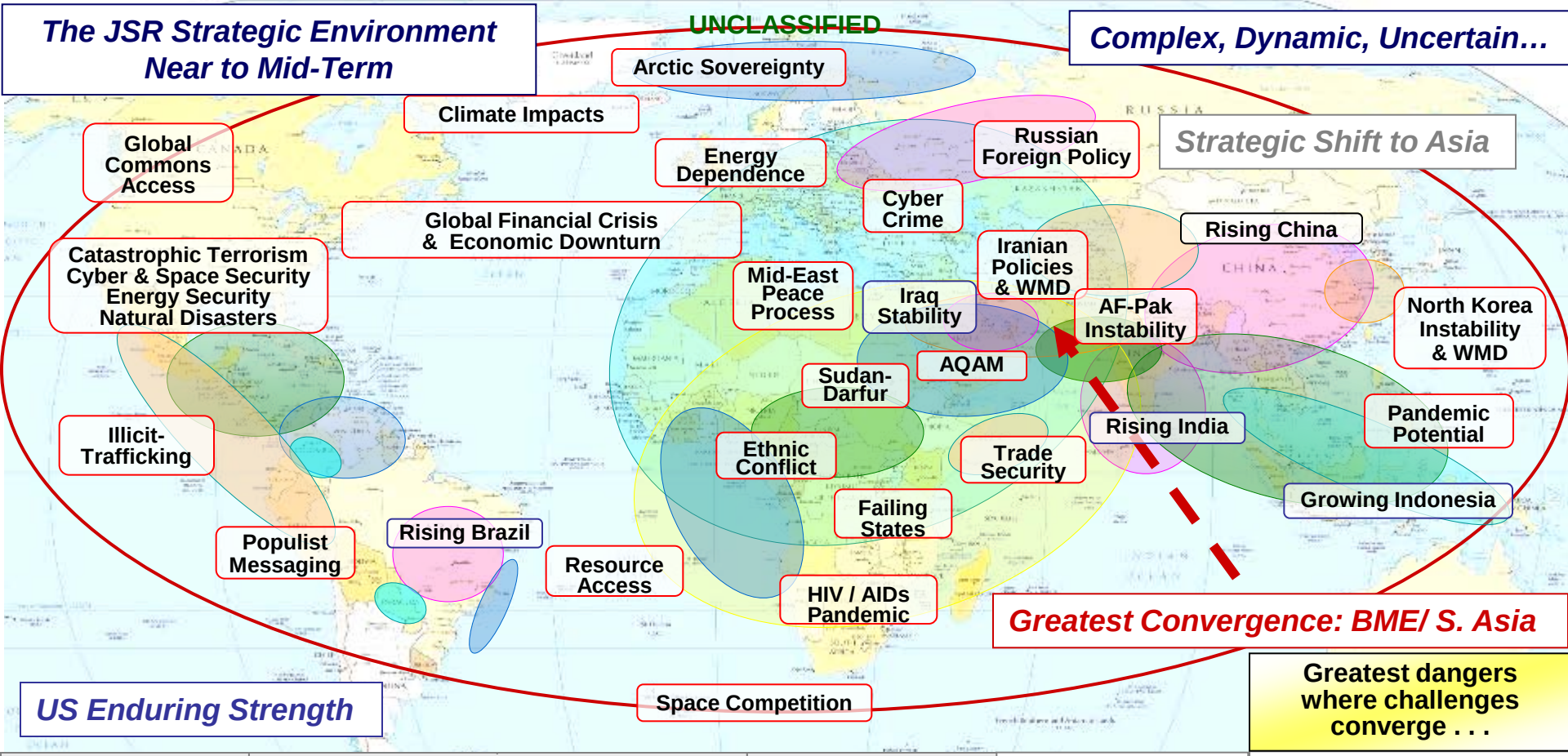


Changing distribution of power indicates evolution to a "multi-nodal" world characterized more by shifting, interest-driven coalitions based on diplomatic, military, and economic power, than by rigid security competition between opposing blocs.

The JSR Strategic Environment Near to Mid-Term

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Complex, Dynamic, Uncertain…



Greatest dangers where challenges converge . . .

Global Variables

Political
- International & Regional Institutions
- US Leadership
- Governance
- Nation-State
- Non-States

Economic
- Global Systems
- Growth
- Integration & Interdependence
- Commodities Demand
- Competition

Military
- Complex Conflicts
- Full Spectrum Threats
- Relative Capabilities
- Alliances
- WMD

Social-Cultural
- Development Level
- Urbanization
- Migration
- Religion
- Organized Crime
- Health

Influence – Identity, Values, Rules & Norms, Ideology, Competition

Information – Technology Profusion, Information Access, Alternative Sources

Global Meta-Trends
- Globalization
- Demographics
- Power Redistribution
- Rising Demand for Resources
- Changing Climate

Strategic Challenges
- WMD Proliferation
- Resource Competition
- Security – Global Commons
- Regional Instability
- Powerful States
- Transnational Violent Extremists
- Transnational Crime
- Severe Natural Events

Achieving Our National Military Objectives

Theme

- **The Joint Force must redefine how we lead**
- **Leadership is about more than power—it is about our approach to exercising power**
- **Employ a spectrum of leadership approaches**
  - **Facilitator**
  - **Enabler**
  - **Convener**
  - **Guarantor**
- **Pursue broader and more effective partnerships and emphasize mutual responsibility**

Counter Violent Extremism

- **Employ military power in a precise and principled way**
- **Build partner capacity and support a whole-of-nation strategy to make efforts sustainable**
- **Develop deterrence principles against extremists**

Strengthen International and Regional Security

- Fundamental link between prosperity and security
  - The military plays a powerful role in maintaining a stable international environment that is critical for prosperity at home
- Exercise "convening power"
  - Addressing common problems
  - Increasing interoperability
  - Helping other nations develop more comprehensive security relations

Deter and Defeat Aggression

- Exercise a variety of deterrence approaches
  - Strategic
  - Conventional
  - Whole-of-Nation
  - 21st century threats such as cyber aggression and violent extremism
- Increasing interdependence of war-fighting domains
  - Enabling capabilities and joint assured access to the global commons will remain critical to defeating aggression and countering emerging anti-access and area denial strategies

Shape the Future Force

- Reconcile our national interests with the emerging strategic environment to help inform our future global force posture
- Need to leverage expanded and more effective relationships to enhance regional stability
- The all-volunteer force will remain our military's greatest strategic asset

The NMS must support national security and defense strategies

Counter Violent Extremism

- **Succeed in our current campaigns in Afghanistan and Pakistan**
- **Expand focus to VEOs in other geographic concentrations and reduce safe-havens / sanctuaries (Yemen, Somalia, etc)**
- **Strategic, whole-of-nation approach to countering violent extremism**
- **Strengthen and expand our network of partnerships to enable partner capacity to enhance security**
- **Adapt deterrence principles in efforts to counter extremists (shape cost / benefit decisions)**
- **Measured and appropriate response to terrorism (National Resiliency)**
- **Employ military power in concert with other instruments of power in a precise and principled manner**



There is no more vital interest than the security of the American people, our territory, and our way of life

Deter and Defeat Aggression

- **Deterrence approach:** ***We will maintain a safe, secure, and effective strategic deterrent***
  - **Strategic - nuclear arsenal and overseas missile defense**
  - **Conventional - ability to rapidly & globally project power in all domains**
  - **Support whole of nation approach**
  - **21st century - enhance deterrence in air, space, & cyberspace**



- **Defeat approach:** ***The core task of our armed forces remains to defend our Nation and win its wars***
  - **Support National approaches to counter anti-access and area-denial strategies**
  - **Complementary, multi-domain power projection and joint forcible entry competencies**
  - **Enduring Joint Force mission - assured access to the global commons**
  - **Our ability to operate effectively in space and cyberspace, in particular, is increasingly essential to defeating aggression**

Preventing wars is just as important as winning them. The Joint Force will be prepared to deter & defeat regional aggression that would threaten our national interests.

Strengthen International & Regional Security

- Strengthening international and regional security requires that our forces be globally-available, yet regionally-focused
- Defend the homeland and play critical role in supporting homeland security
- NATO remains our preeminent multilateral alliance
- Strategic priorities and interests will increasingly emanate from the Asia-Pacific region



- Deepen bilateral relations & foster security cooperation
- Leverage our convening power to foster regional and international cooperation in addressing transnational security challenges
- Actively partner with other U.S. Government agencies to pursue theater security cooperation to increase collective security skills

Our approach to leading will differ according to the unique combination of challenges we face

Shape the Future Force

- Focus on Our People
  - Grow leaders who can truly out-think and out-innovate adversaries
  - Develop leaders who are capable of operating in interagency and multi-national environments
  - Think and engage more broadly about the civil-military continuum & embedded commitments



- Improve Our Capabilities and Readiness
  - Must not become a hollow force with a large force structure lacking the readiness, training and modern equipment it needs
  - Mix of systems & organizations capable of full spectrum operations across land, maritime, air, space & cyber domains
  - Joint nuclear forces will continue to support strategic stability: assured second-strike capability; effective, safe, & secure forces
  - Readiness must remain a top priority, as our forces, systems, and capabilities will continue to be under extraordinary stress

Our focus on leadership, not simply power, necessitates that we emphasize our values and our people as much as our platforms and capabilities

Precision Strike Implications

- Precision is a key concept in the 2011 NMS:

> ***… we will employ military force in concert with other instruments of power and in a precise and principled manner. Precise does not mean perfect, and principled does not mean uncompromising. But we must recognize the inherent complexity in war among peoples. The risk we assume by minimizing collateral damage to innocents is balanced by a reduction of risk to turning even more people against our broader mission. Thus, the disciplined application of force is consistent with our values and international law, increases our chances of strategic and operational success, and more effectively advances national policy.***

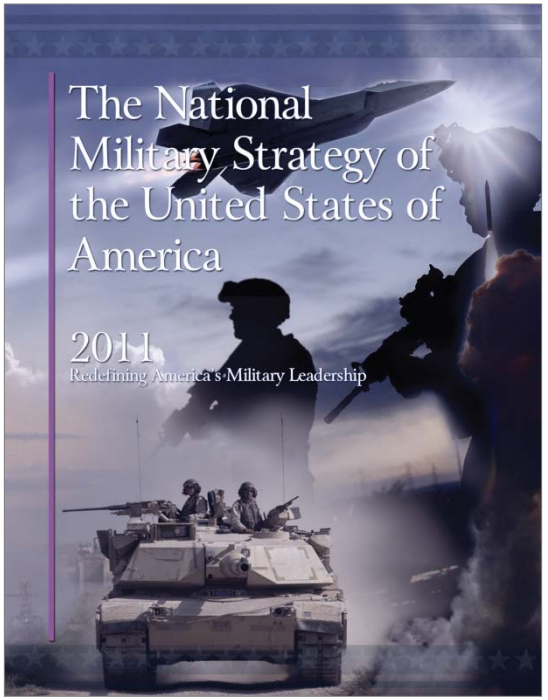


> ***The ability to create precise, desirable effects with a smaller force and a lighter logistical footprint depends on a robust ISR architecture.***

> ***Forces will operate with an aptitude for precise and discriminate action …***

Conclusion

- Lead through a strategic inflection point
- Enable whole-of-nation approaches to address national security challenges
- Broad portfolio of leadership approaches
- Joint Force that is flexible, agile, and adaptive
- Emphasize people as much as platforms
- Care for service members and their families



Leadership is how we exercise the full spectrum of power to defend our national interests and advance international security and stability.

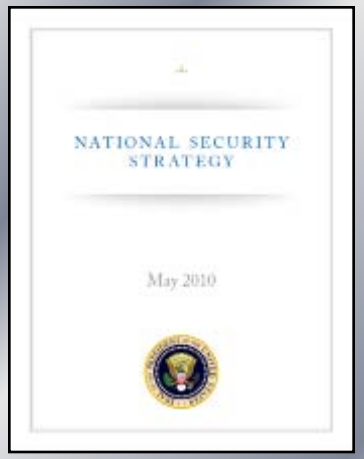
Questions?



Strategic Direction

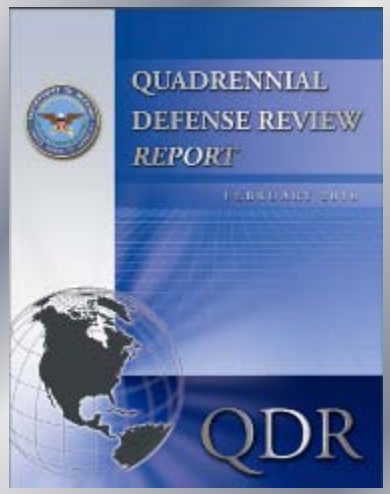
U.S. Government
Geo-Political/Geo-Economic

NSS



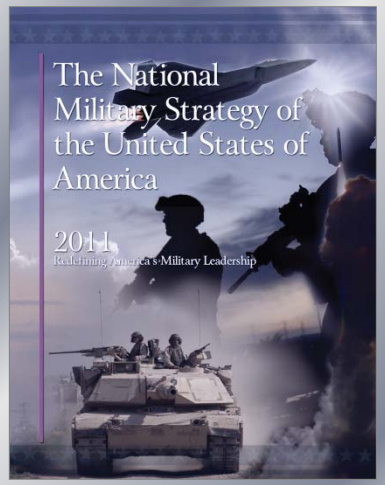
Department of Defense
Political-Military

QDR Report



Armed Forces
Military

NMS



ENDS

MEANS

WAYS

The NMS is Well Aligned with NSS & QDR – Focused on Military Ways

2010 National Security Strategy



Enduring National Interests

- The security of the U.S., its citizens, and U.S. allies and partners
- A strong, innovative, and growing U.S. economy in an open international economic system that promotes opportunity and prosperity
- Respect for universal values at home and around the world
- An international order advanced by U.S. leadership that promotes peace, security, and opportunity through stronger cooperation to meet global challenges

Strategic Approach

The World We Seek

- Building our foundation
- Pursuing comprehensive engagement
- Promoting a just and sustainable international order

Security

- Strengthen security and resilience at home
- Disrupt, dismantle, and defeat Al-Qaida and its violent extremist allies in Afghanistan, Pakistan and around the world
- Reverse the spread of nuclear weapons and secure nuclear and biological materials
- Advance peace, security, and opportunity in the Greater Middle East
- Invest in capacity of strong capable partners
- Secure cyberspace

Values

- Strengthen the power of our example
- Promote democracy and human rights abroad
- Promote dignity by meeting basic needs

Prosperity

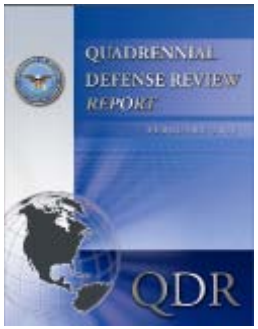
- Strengthen education and human capital
- Enhance science, technology, and innovation
- Achieve balanced and sustainable growth
- Accelerate sustainable development
- Spend taxpayers' dollars wisely

International Order

- Strengthen alliances
- Build cooperation with other 21st century centers of influence
- Strengthen institutions and mechanisms for cooperation
- Sustain broad cooperation on key global challenges

"We must pursue a strategy of national renewal and global leadership."

2010 Quadrennial Defense Review



Four Defense Objectives (Ends):

- Prevail in Today's Wars
- Prevent and Deter Conflict
- Prepare to Defeat Adversaries and Succeed in a Wide Range of Contingencies
- Preserve and Enhance the All-Volunteer Force

Six Key Missions (Ways):

- Defend the United States and support civil authorities at home
- Conduct counterinsurgency, stability, and counterterrorist operations
- Build the capacity of partner states
- Deter and defeat aggression in anti-access environments
- Prevent proliferation and counter weapons of mass destruction
- Operate effectively in cyberspace

Force Sizing Criteria (Means):

Representative combinations of the types of overlapping operations against which DOD sizes its forces include the following:

- A major stabilization operation, deterring and defeating a regional aggressor, and extended support to civil authorities in response to a catastrophic event in the US
- Deterring and defeating two regional aggressors while maintaining a heightened alert posture for US forces in and around the US
- A major stabilization operation, a long-duration deterrence operation in the same theater, a medium sized counterinsurgency mission in a separate theater, and extended support to civil authorities in responding to multiple, geographically dispersed events

"The United States needs a broad portfolio of military capabilities with maximum versatility across the widest possible spectrum of conflict."

History of the NMS

1989

"Adaptability & Flexibility"

Objective: Maintain deterrence as Soviet threat diminishes; prepare for "peace dividend"

Purpose: Advice for Guidance

Context: Glasnost & Perestroika, Proliferation, Growing Instability

National Military Objectives

- Deter Attack by Soviet Union
- Reduce Reliance on Nukes
- Increase US Influence
- Encourage/Assist Allies & Friends
- Protect Commerce & Access
- Retard NBC proliferation
- Halt Transfer of Militarily Significant Technology
- Stem the Flow of Illegal Drugs

1992

"Beyond Containment"

Objective: Define the "Base Force"

Purpose: Advice

Context: Soviet Union Collapse, Panama, Berlin Wall, Gulf War

Foundations

- Strategic Deterrence & Defense
- Forward Presence
- Crisis Response
- Reconstitution

1995

"Flexible & Selective Engagement"

Objective: Define Military Roles in Smaller Scale Contingencies

Purpose: Outlines best use of military

Context: Somalia, Rwanda, Balkans, "Bottom-Up" Review

National Military Objectives

- Promote Stability
- Thwart Aggression

1997

"Shape, Respond, Prepare"

Objective: Establish 2 MTW Capability

Purpose: Advice

Context: Bosnia, Colombia, Terrorism, QDR 97

National Military Objectives

- Promote Peace & Stability
- Defeat Adversaries

2004

"Protect, Prevent, Prevail"

Objective: Win the War on Terrorism

Purpose: Supports NSS & implements NDS

Context: 9-11, GWOT, Afghanistan, Iraq, QDR 01

National Military Objectives

- Protect the United States
- Prevent Conflict & Surprise Attacks
- Prevail Against Adversaries

Headquarters U.S. Air Force

Integrity - Service - Excellence

SAF/IA:
Building Relationships, Capabilities, and Capacity

Maj Gen Michael Snodgrass
Assistant Deputy Under Secretary International Affairs

U.S. AIR FORCE

U.S. AIR FORCE

Our Message



President Barack Obama

"The burdens of a young century cannot fall on American shoulders alone…we will be steadfast in strengthening those old alliances that have served us so well…we will build new and deeper partnerships in every region, and strengthen international standards and institutions."

"Helping other countries better defend themselves or fight beside us – by providing equipment, training, or other forms of support – is something the United States has been doing in various ways for nearly three-quarters of a century."



Secretary Robert Gates



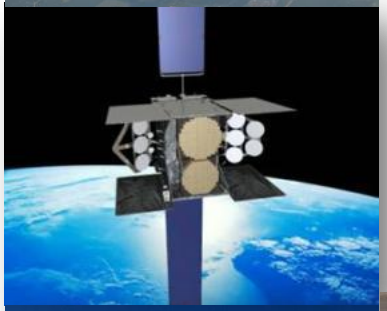
General Norton Schwartz

"Building partner capacity…emphasizes reliance upon the partner governments that have superior insight into and perspective of their regional and local socio-political, economic, and security concerns, and can address them more directly and efficiently than we can."

U.S. AIR FORCE

AF Mission







Fly, Fight And Win…

in Air,

Space

and Cyberspace







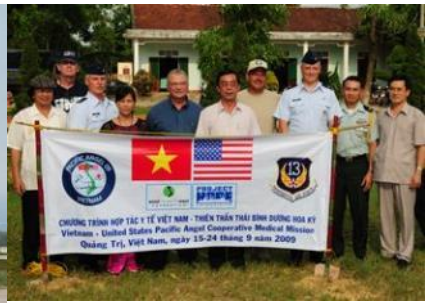


U.S. AIR FORCE

USAF Priorities

- **Continue to strengthen Air Force nuclear enterprise**
- ***Partner with the joint and coalition team to win today's fight***
- **Develop and care for Airmen and their families**
- **Modernize our air and space inventories, organizations and training**
- **Recapture acquisition excellence**



U.S. AIR FORCE

USAF Organization

Secretariat

Secretary of the Air Force
Hon. Michael Donley



Under Secretary
Hon. Erin Conaton



Deputy Under Secretary, International Affairs
SES Heidi Grant



Asst. SAF/IA
Maj Gen Snodgrass



Strategy
SES Kelli Seybolt



Regional
Brig Gen Sherlock



Policy
SES Gerald Hust



AFSAC
Brig Gen Lanni



AETC/IA
SES George Gagnon



Air Staff

Chief of Staff
Gen Schwartz



Vice Chief of Staff
Gen Breedlove



Asst. Vice Chief of Staff
Lt Gen Newton



Foreign Liaison Division
Col Johnson



SAF/IA Organization



Ms Heidi Grant
SAF/IA



Maj Gen
Mike Snodgrass
Asst SAF/IA

AD/RC Military - 93/27
Civilian/Contractors - 80/43



Brig Gen Lyn Sherlock
Regional Directorate

Col Tim Carey
Deputy

- AFRICOM
- EUCOM
- CENTCOM
- PACOM
- NORTH / SOUTHCOM
- Weapons



Mr. Gerald Hust
Policy Directorate

Col Thomas Huizenga
Deputy

- International Airmen
- Armaments Cooperation
- Space & Cyberspace
- Disclosure & Tech Transfer
- Education & Training Policy



Ms Kelli Seybolt
Strategy, Operations & Resources

Col Robert Singleton
Deputy

- Strategy & Plans
- Programming & Resources
- Technology & Integration

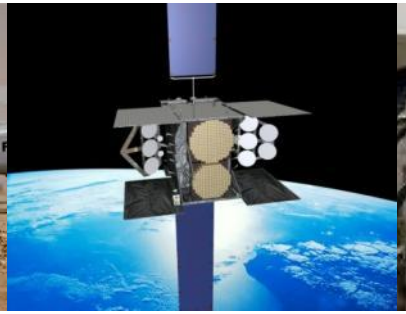
Vision

The Air Force leader for policy, activities, and interactions that promote and sustain international relationships, interoperable capabilities, and sustained engagement with partners across the globe in support of National Security Objectives

Mission

SAF/IA, in concert with other AF and joint partners, conducts sustained security cooperation activities across the spectrum of operations by military-to-military engagement to build partner capability and capacity throughout the air, space and cyberspace domains to promote effective joint and coalition air operational success







U.S. AIR FORCE

SAF/IA Objectives

Develop & sustain partnerships consistent with US national security and foreign policy goals



U.S. AIR FORCE

What we do

- We…
  - do mil-to-mil engagement to *build partner capability*
  - facilitate FMS/FMF/IMET to *build partner capacity*
  - exercise/Train with partners to *enable operational success*
- Within U.S. foreign policy
- By…
  - working with our partners to balance their needs with resource availability
  - focusing on high-payoff enterprises

U.S. AIR FORCE

Tools of the Trade



Security, Transition, & Reconstruction Teams



Strategic Communications



Foreign Military Sales / Direct Commercial Sales



International Air & Trade Shows



State Partnership Program



Disclosure & Technology Transfer



Armaments Cooperation



USAF-Partner Air Force Review



Foreign Partner CONUS Beddown



Senior Leader Contacts



Intelligence Sharing



Personnel Exchange



Language and Cultural Awareness



Attached Personnel to US Embassies



Education & Training



Aviation Advisors



Exercises

Integrity - Service - Excellence

U.S. AIR FORCE

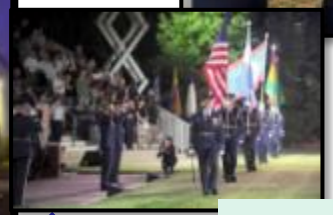
Global Partnering

Diplomacy









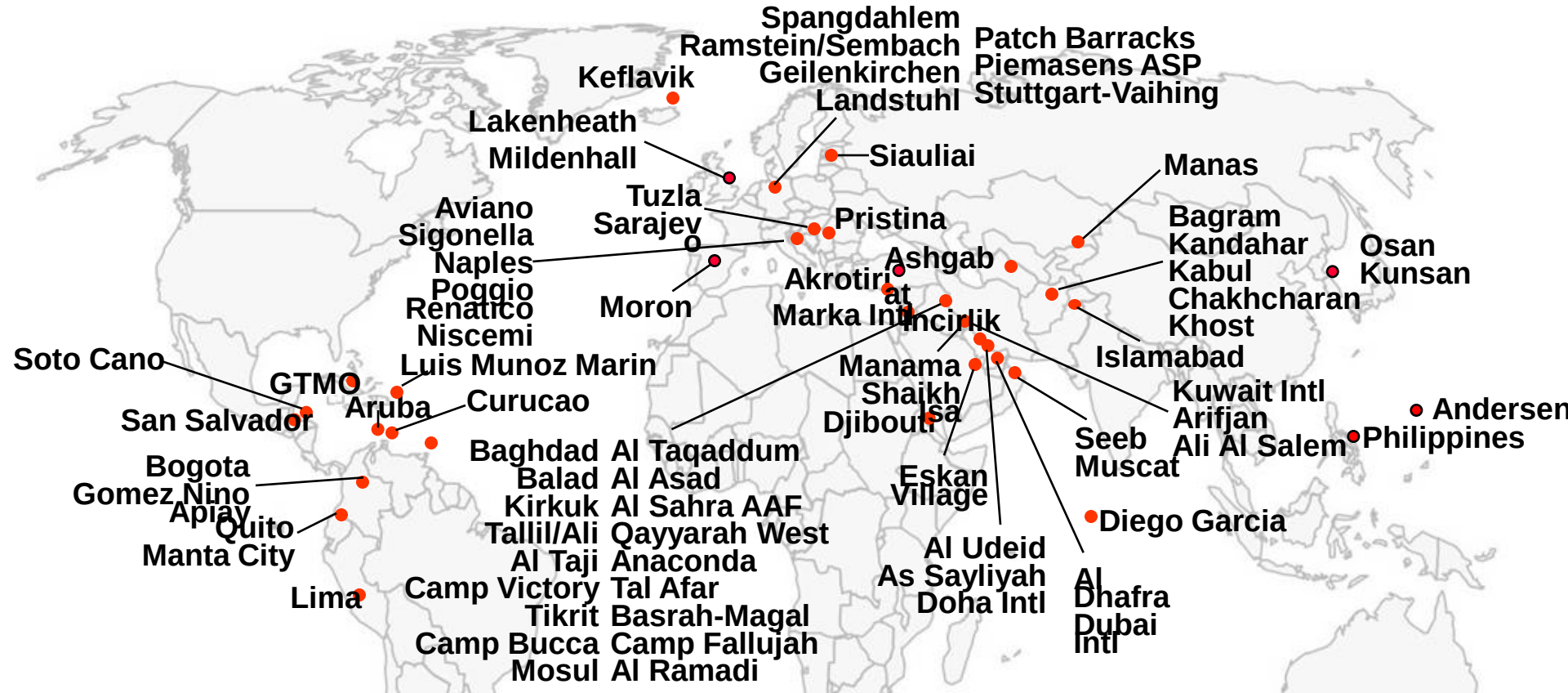
Intelligence

Economics

Military

Forward Operating Locations

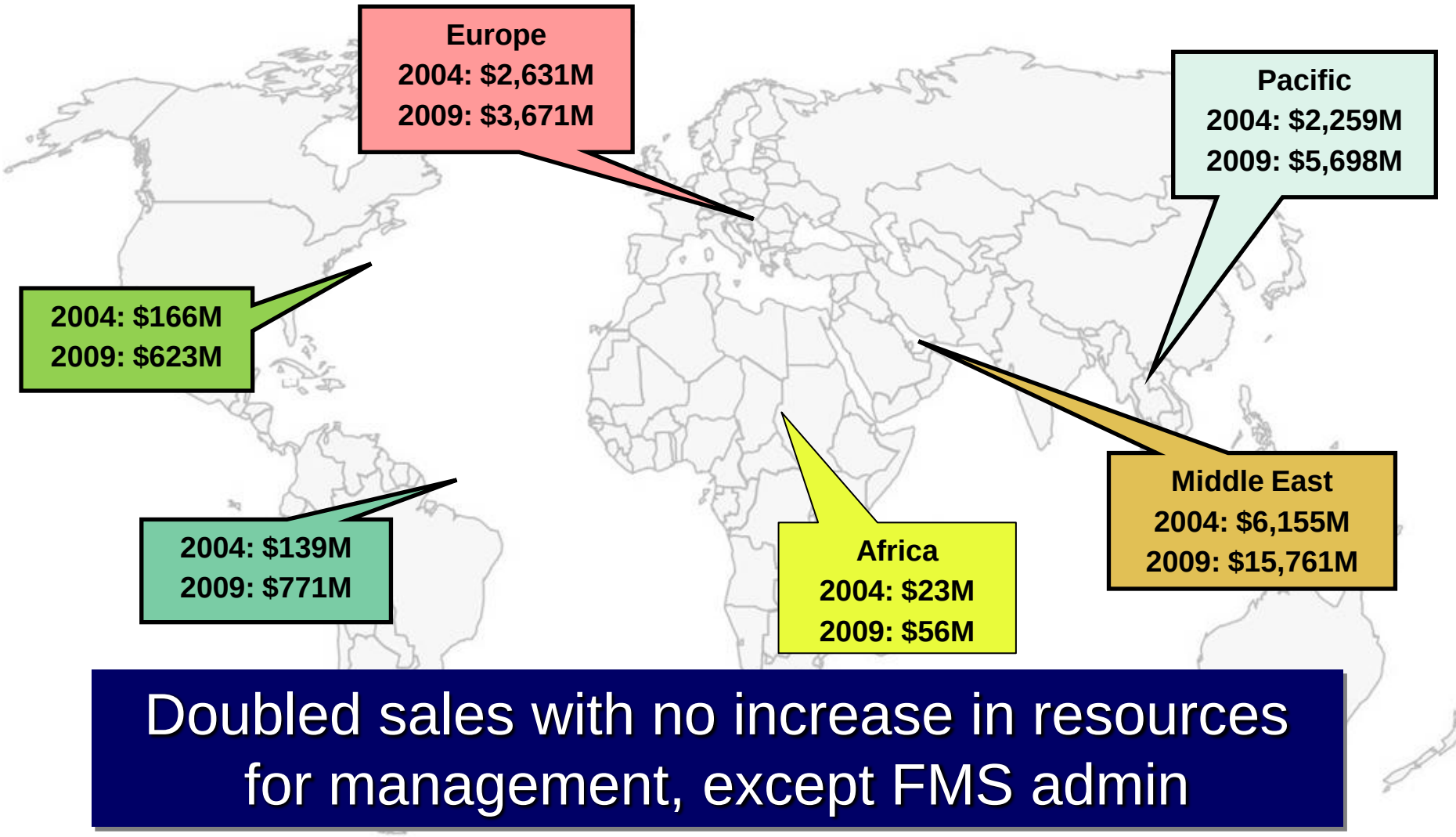
U.S. AIR FORCE



We are a globally arrayed force,
so that we can operate with anyone

U.S. AIR FORCE

FMS Sales by Region 2004 / 2009



Doubled sales with no increase in resources for management, except FMS admin

U.S. AIR FORCE

Security and Stability Challenges

- Training Capacity
- Responsiveness
- Budget Constraints
- Delivering a capability



How We Accomplish Our Mission

Capabilities-Based Approach



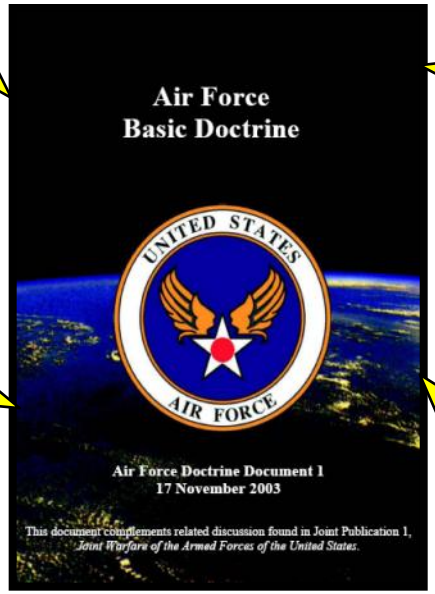
ConOps



Training

Proficiency







Maintenance

Doctrine

Logistics

Chile - Professional Military Training

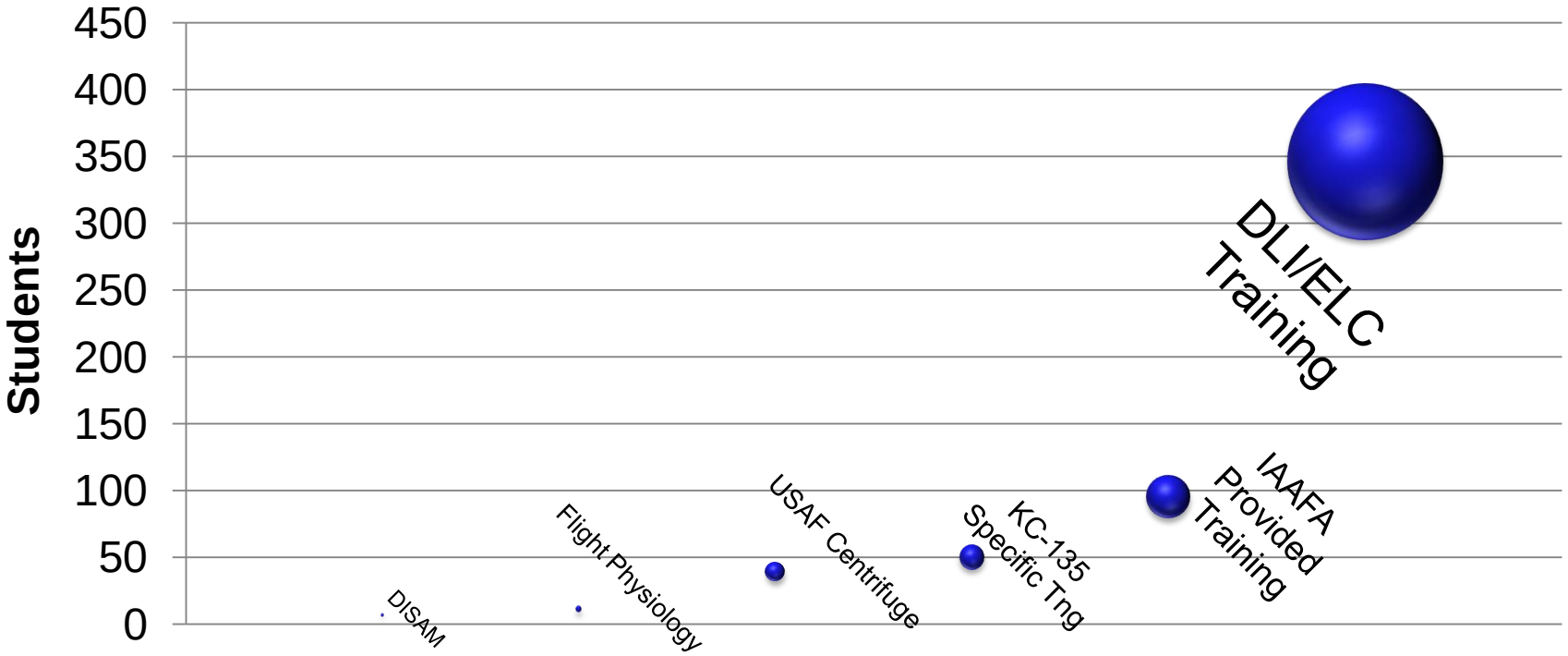


Chart Depicts USAF Provided PMT from 2007 through 2010

- **Over 580 Students in Total from Chile**

U.S. AIR FORCE

Building Partner Nation Capacity
Chilean F-16 Evolution



Task from SOUTHCOM's Chile Country Campaign Plan
Encourage Chilean Military Forces to Procure Equipment and Systems Compatible and Interoperable with U.S. and Allied Nations Systems.

GOAL
Fully Capable F-16 Coalition Partner

- Mar 06 — 1st F-16 Delivered
- Oct 07 — WILLKA Bi-lateral ACT
- Mar 08 — NEWEN Bi-lateral ACT
- Oct 09 — SALITRE Multi-Lateral DACT
- Oct 10 — CRUZEX Multi-Lateral DACT
- 2011 — RED FLAG Observer
- 2012 — RED FLAG Participant

***Air Refueling Capability** (Feb 10)*
Through Transfer of Excess Defense Articles

US-Led SME Engagements (Ops, Mx, SE, etc.)

Chilean-Developed Academics / Professional Training Events

Integrity - Service - Excellence

U.S. AIR FORCE

State Partnership Program

National Guard Bureau program

- **Improves military interoperability**
- **Demonstrates subordination to civil authority**
- **Provides support to civil authorities**
- **Assists development of democratic institutions**
- **Fosters open market economies**

Ohio ANG colonel briefing Serbia and Hungary CHODs at Springfield ANGB OH





Ohio ANG crew chief and Hungarian Air Force maintainer carry F-16 travel pod during LOAD DIFFUSER exercise in Hungary



Ohio ANG and Serbia officers at Toledo ANGB observing operational readiness exercise

Return to Tools

U.S. AIR FORCE

Technology Transfer & Disclosure

Advanced military technology shared with partner nations

The requirement for transfer & disclosure:

- **US forces must be ready to engage across the spectrum of operations as part of a joint, multinational, or interagency force**
- **Multinational ops require that participating forces have interoperable capacity to execute assigned missions**



AIM-9M

AIM-120



Significant Export Approvals:

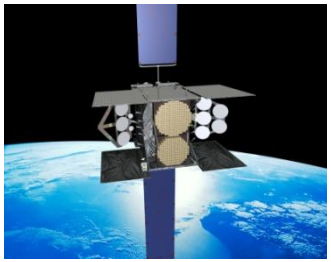
- **AIM-9M approved 4-5 years after IOC to 8 partner nations**
- **AMRAAM approved 2 years after IOC to 17 partner nations**
- **F-16 Block 60 approved, not in USAF inventory**
- **F-35 technologies approved to support weapon system co-development with 8 partner nations**

Return to Tools

U.S. AIR FORCE

Cooperative Relationships

Jointly developing and enhancing capabilities through partnership









- International Armaments Cooperation
- Joint Development
- Research & Development
- Test & Evaluation
- Executing through international agreement
- Leverages partner resources to promote interoperability, common capabilities, and cost savings

- US & AUS jointly developed Wideband Global SATCOM (WGS), expanded constellation
- NATO C-17 Strategic Airlift Capability
- $4.4B to F-35 (Joint Strike Fighter) development with eight partners
- C-130J block upgrade costs shared by seven nations, 1/3 reduction in USAF costs

Return to Tools

U.S. AIR FORCE

Exercises

Alliances and partnerships cultivated through bilateral and multinational exercises and competitions

- **Regional Training Centers**
- **Wargaming**
- **Building Partnership Capacity Seminars**
- **Competitions**
- **Weapon Systems Evaluation Programs**
- **Distributed Mission Operations**







Pakistan Air Force at Red Flag





Denmark attended first GREEN FLAG Apr 10 Conducted Combat Enhancement Training at Luke, AFB

Other Exercise Examples

- **Blue Flag**
- **AMC Rodeo**
- **Atlantic Strike**
- **Angel Thunder**

Return to Tools

U.S. AIR FORCE

Mission Examples



Poland C-130 no-cost lease



Chile KC-135 response to Santiago earthquake



US-UK RC-135 Agreement



Colombia T-37 Trainer

Partnerships

Relationships



Capabilities

Mutual Benefits

Weapons Systems Acquisition

David G. Ahern

Portfolio Systems Acquisition
Office of the Assistant Secretary of Defense
(Acquisition)

February 24, 2011

Agenda

- DoD Priorities & Efficiencies
- Legislation and Initiatives
  - Weapon System Acquisition Reform Act
  - Improve Acquisition Act
- Precision Strike Weapons
  - Programs
  - Trends
  - Focus Areas
  - Acquisition Strategy considerations
- Program Manager Focus Areas
- Some Traits of an Effective PM

Excerpts from Secretary Gates January 6, 2011 Speech

- America is at war and confronts a range of future security threats, it's important not to repeat the mistakes of the past by making drastic and ill-conceived cuts to the overall defense budget.
- At the same time, it is imperative for this department to eliminate wasteful, excessive and unneeded spending, to do everything we can to make every defense dollar count.
- The goal was, and is, to sustain the U.S. military's size and strength over the long term by reinvesting those efficiency savings in force structure and other key combat capabilities.

Excerpts from Secretary Gates January 6, 2011 Speech (con't)

- Not every defense program is necessary, not every defense dollar is sacred and well spent, and that more of nearly everything is simply not sustainable.
- The Defense Department will continue to see real, albeit steadily diminishing, growth for the next three fiscal years before flattening out in the fourth and fifth year.
- What is important is to have a budget baseline with a steady, sustainable and predictable rate of growth that avoids extreme peaks and valleys in defense spending that can be enormously harmful to readiness, planning and financial management.

Mandate for Restoring Affordability and Productivity in Defense Spending (USD(AT&L) June 28, 2010 Memo)

- Deliver the warfighting capability we need for the dollars we have
- Get better buying power for warfighter and taxpayer
- Restore affordability to defense goods and services
- Improve defense industry productivity
- Remove government impediments to leanness
- Avoid program turbulence
- Maintain a vibrant and financially healthy defense industry

Obtain 2-3% net annual growth in warfighting capabilities without commensurate budget increase by identifying and eliminating unproductive or low-value-added overhead and transfer savings to warfighting capabilities. ***Do more without more.***

USD(AT&L) 23 Principal Actions Addressing 5 Major Areas

- Target Affordability And Control Cost Growth
- Incentivize Productivity And Innovation In Industry
- Promote Real Competition
- Improve Tradecraft In Services Acquisition
- Reduce Non-productive Processes And Bureaucracy

USD(AT&L) Memo, September 14, 2010: "Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending"

Target Affordability And Control Cost Growth

- Mandate affordability as a requirement
- Drive productivity growth through Will Cost/Should Cost management
- Eliminate redundancy within warfighter portfolios
- Make production rates economical and hold them stable
- Set shorter program timelines and manage to them

Incentivize Productivity And Innovation In Industry

- Reward contractors for successful supply chain and indirect expense management (Navy prototype)
- Increased Fixed-Price Incentive Firm Target use where appropriate using a 50/50 share line and 120 percent ceiling as a point of departure
- Adjust progress payments to incentivize performance
- Extend the Navy's Preferred Supplier Program to a DoD-wide pilot
- Reinvigorate industry's independent research and development and protect the defense technology base

Promote Real Competition

- Present a competitive strategy at each program Milestone
- Remove obstacles to competition
- Increase dynamic small business role in defense marketplace competition

Improve Tradecraft In Services Acquisition

- Create a senior manager for acquisition of services in each component, following the Air Force's example
- Adopt uniform taxonomy for different types of services
- Address causes of poor tradecraft in services acquisition
- Increase small business participation in providing services

Reduce Non-Productive Processes And Bureaucracy

- Reduce the number of OSD-level reviews to those necessary to support major investment decisions or to uncover and respond to significant program execution issues
- Eliminate low-value-added statutory processes
- Reduce by half, the volume and cost of internal and congressional reports
- Reduce non-value-added overhead imposed on industry
- Align Defense Contract Management Agency (DCMA) and Defense Contract Audit Agency(DCAA) processes to ensure work is complementary
- Increase use of Forward Pricing Rate Recommendations (FPRRs) to reduce administrative costs

Initiatives & Revised Processes

- Weapon System Acquisition Reform Act
- Improve Acquisition Act (p/o FY11 NDAAA)
- Program Manager Empowerment and Accountability

Weapon System Acquisition Reform Act

- **Established offices of**
  - Cost Assessment and Program Evaluation
  - Developmental Test and Evaluation and Systems Engineering (as separate and equal organizations)
  - Performance Assessment and Root Cause Analysis
- **Codified role of the Commanders of the Combatant Commands in Identifying joint military requirements**
- **Requires acquisition strategies to ensure competition throughout the lifecycle of Major Defense Acquisition Programs**
- **Requires competitive prototyping before Milestone C**
- **Program manager to notify the Milestone Decision Authority, if at any time prior to a Milestone B decision, the estimate of the total program cost grows by more than 25% or the program schedule for initial operational capability grows by more than 25%**

Improve Acquisition Act (FY 11 NDAA)

- **Part I –Defense Acquisition System**
  - Adds section to Title 10 specifying USD(AT&L) as responsible for management of the acquisition system, directs service chiefs to assist SAEs with acquisition related functions, and directs independent performance assessments by PARCA
  - Requires the Department to establish a requirements system specific to the acquisition of services
  - Authorizes a pilot for the acquisition of military purpose non-developmental items from non-traditional contractors ($50K max per contract; 9 mo. max to deliver first lot)
- **Part II Defense Acquisition Workforce**
  - Directs establishment of performance management system for the acquisition workforce including performance plans for individuals
  - Requires the Department to focus on the proper development, assignment, and employment of civilian members of the acquisition workforce
  - Directs a review of acquisition curricula offered by DAU
- **Part III Financial Management**
  - Addresses DoD financial management/audit readiness Department-wide
  - Requires a review of obligation/expenditure benchmarks
- **Part IV Industrial Base**
  - Includes provisions intended to expand the industrial base
  - Provides for DoD approval/disapproval of contractor business systems
  - Authorizes an industrial base fund

Precision Strike Weapons Programs

ACAT I

- Joint Direct Attack Munition (JDAM)
- Joint Standoff Weapon (JSOW)
- Joint Air-to-Surface Standoff Weapon (JASSM/JASSM-ER)
- Advanced Anti-Radiation Guided Missile (AARGM)
- Excalibur
- Guided Multiple Launch Rocket System (GMLRS)
- Small Diameter Bomb Increment II (SDB II)
- Tactical Tomahawk (Block IV)

Pre-MDAP

- Joint Air to Ground Missile (JAGM)
- Offensive Anti-Surface Warfare (OASuW) weapon

Precision Strike Weapons
Trends

- Multi-sensor weapons
- Expanded target sets
- Resistance to countermeasures
- Network enabled
- Third-party targeting
- Autonomous targeting
- Improved capability against movers
- Increased standoff
- Improved sustainability
- Insensitive munitions
- Block upgrades to maintain pace with threats
- Multi-platform capable (interoperability)
- Increased weapon loadouts
- Jointness

Precision Strike Weapons
Focus Areas

- Achieving weapon system affordability
  - Universal Armament Interface (UAI)
- Achieving system reliability
- Reducing concurrency of testing and production
- Shifting weapon procurement rates toward Economic Order Quantity levels
- Ensuring rigorous DT testing prior to OPEVAL entry
- Assessing common weapon risk elements (ie, fuzing)
- Assessing predicted performance against potential threats
- Expanding competition, including international participation
- Executing robust competitive prototyping to reduce technical risk and control costs
- Assessing industrial base vulnerabilities for primary subsystems
- Preserving Jointness

Provide weapon deliveries to warfighter that strikes optimum balance:
urgency of need --- performance --- affordability of product

Precision Strike Weapons
Acquisition Strategy Considerations

- What is the true “should-cost” for this weapon system?
- What’s the true risk drivers for development?
- Cost Plus versus Fixed Price development contracts?
- Should we procure the data package?
- Is the program office’s proposed weapon procurement rate realistic?
- Which weapon’s subsystems/technologies are driving risk reduction?
- What’s the weapon’s integration risk with designated platforms?
- Does the proposed testing (CT, DT, IT, OT) strike the correct balance between M&S, captive carry, free flight testing, etc to minimize cost while ensuring Effectiveness and Suitability?
- Is there a way to accelerate weapon capability to the warfighter through incremental development?
    - Open Systems architecture (hardware and software)
- How do we sustain competition throughout the life of this program?
    -Open Systems architecture (hardware and software)
- Is a multiyear procurement appropriate?

Focus Areas for Program Managers

- Complicated acquisition system
  - Must balance stakeholders different priorities
    - Requirements, Resources
    - Services, OSD
    - Congress, Industry
- Business acumen a must
- Training/Experience/Mentoring
  - Before needed
  - PM + Staff
- Objectivity vs. blind advocacy
- Know program status
  - Cost/Schedule/Performance (use metrics)
    - EVM
- Affordability
- Domain awareness
- Reliability, Availability, Suitability
- Positive management of issues, risks and opportunities

What Makes A “Good” PM? Thoughts and Observations

- Is highly effective at building coalitions. Seeks win-win opportunities
- Makes program goals clear and helps everyone "visualize“ success
- Promotes transparency and invites constructive criticism. An effective listener humble enough to learn
- Confronts issues constructively and objectively. Passion is good; self control is paramount
- Makes time for people and models behaviors that promote teamwork
- Empowers subordinates
- Has the courage to report difficult news … proactively
- Is an effective communicator
- Tolerates ambiguity and leads effectively through it
- Delivers results

Summary

- Focus on affordability!
- Budgets will be tight
- Well planned and well executed programs

Be Part of Continuing Process Improvement!

Backups

Tips for Program Manager Success

1. Know Your Neighborhood

- Even Service-specific programs will need to work in a joint environment
  - Understand broader context of how your program fits into larger architecture and make provisions
  - Department will tend to value programs that work well with other Service systems
- Build relationships with other programs
  - Program Managers, program offices, contractors

2. Pay 'Em Now ... Or Pay 'Em Later

- Shepherding programs through DAB process is <u>hard work.</u> Many stakeholders, legitimate interests
  - Start early; develop a plan w/schedule
  - Engage openly.
    - Focus Meetings & WIPTs to resolve what can be resolved;
    - Elevate promptly any unresolved issues
  - Proper staff work demands "no surprises" at the DAB
    - Consensus not required, but issues must be framed
  - Preserve the DAB members' time

3. It's More Than Paper ... It's Your Contract

- Acquisition Strategy, Acquisition Program Baseline, Test & Evaluation Master Plan, and Systems Engineering Plan are the foundation
  - They form a contract among the parties
  - Make them solid and keep up to date
- Program Management Agreement (PMA) sets annual expectations, gives you basis to say "no" to requirements creep
- Tailor to meet your needs and fit your program
- Concise, direct writing always helps

4. Just Say "No"

- PMs must hold the line on "requirements creep"
  - Warfighters; but not just warfighters
- Evolutionary acquisition provides for follow-on blocks and increments to meet warfighting needs
  - Build a time-phased plan to meet objectives
- "Configuration Steering Boards" to help control costs
  - SAE chaired, OSD and JS reps
  - Policy is to adjust content and requirements to stay w/i cost
  - Review requirements changes that can impact cost or schedule
    - Generally defer to future blocks or increments
  - PMs prepare a list of descoping options

5. The Only Thing Constant Is Change

- No program is static ... While proper execution is your best guarantor of success, it's not absolute
  - Program can be overtaken by outside events
- Evolutionary acquisition institutionalizes change
- Congressional marks and Comptroller tweaks are part of program manager's world
- Be proactive rather than reactive
  - Be on the lookout for opportunities to improve efficiency and effectiveness
  - Always have a Plan B

6. OSD Oversight Role

- Our goal is to help you succeed and field military capability on time, within budget, to expected performance
- Warfare offices help guide you through the Milestone Review process
- OIPT/DAES processes have been revised ... How well they will work for you depends on open communication!
- Use us as a resource early on

COLOMBIA:
PRECISION & SUCCESS

February 2011

Republic of Colombia
Military Forces

CONTENTS

1. FARC
2. STATISTICS
3. SUCCESSFUL OPERATIONS
4. NEEDS
5. LIMITATIONS
6. CONCLUSIONS

FARC – TERRORIST GROUP

- Communist Guerrilla / 1964
- Fall of Berlin Wall / 1989
- Peace Talks: 1984 /2002

  - Reinsertion Program

  - Not Reinserted groups
- Failure of Peace Talks / Feb 21 2002

STATISTICS

INDICATORS	2002	2010	VARIATION
• Homicides	28,837	15,459	- 46 % ↓
• Kidnappings	1,708	188	- 89 % ↓
• Terrorist acts	1,645	471	- 71 % ↓
• Infraest. attacks	917	113	- 88 % ↓
• # of armed illegal	37,071	13,709	- 63 % ↓
• Unemployment	14.9%	10.8%	- 28 % ↓
• Poverty	53.7%	45.5%	- 15 % ↓
• Foreign inv. ($B)	2.134	6.524	+ 206 % ↑

SUCCESSFUL MILITARY OPS (Non-Kinetic)

Rescue Operation "JAQUE" Jul/02/08

- **Background:**

  - Political Bounty: US citizens, politicians, military members

- **Material Used (Logistics):**

  Plan A:

  - 02 x MI-17 (Trojan Horse)
  - Crewmembers: 12 (male, female)
  - Intelligence Personnel

  Plan B: Humanitarian Siege

  - 32 x UH-60 (Army-Air Force)
  - 02 x Special Forces Battalions (Army-Navy)

Rescue Operation "JAQUE"

Republic of Colombia
Military Forces



Rescue Operation "JAQUE"

Republic of Colombia
Military Forces



Rescue Operation "JAQUE"

- **Success Factors:**
  - Political Will
  - Persistency: "to think the unthinkable" (President Santos)
  - Sharing of Intelligence
  - Innovation
  - Deception
  - Joint Planning
  - Principles and Values
  - Real Time Communication
  - Training
  - Human Rights: no weapons used

OTHER SUCCESSFUL RESCUE OPS (Non-Kinetic)

Alcatraz: Dec/31/06 Former Minister Fernando Araujo

(Beginning of Rescue Military Ops)

OPERATION "CAMALEON"

Jun/13/10

Republic of Colombia
Military Forces



SUCCESSFUL MILITARY OPS (Kinetic)

OPERATION "SODOMA" Sep/22/10

Republic of Colombia
Military Forces

- **Background:**

  - 40 years of search
  - Symbol of Terror in Colombia
  - Planning in 24 hours
  - Night Operation
  - Participation : 3 Forces aircrafts (Army, Air Force, Police)
    3 Special forces Groups (Army, Navy, Police)

- **Material Used (Logistics):**

  - 35 x Helos (Assault/Escort)
  - 19 x Attack Aircraft
  - 01 x Aircraft / Forward Air Controller

OPERATION "SODOMA"

- **Success Factors:**

  - Special Group against High Value Targets
  - Joint Planning and Execution
  - JCS Conduction
  - Command and Control
  - Training-Experience: aircrew/troops
  - Smart Weapons
  - Night Operation
  - No Collateral Damage

OTHER SUCCESSFUL MILITARY OPS (Kinetic)

• Sol Naciente:	Sep.02/07	Negro Acacio
• Alcatraz II:	Oct.23/07	Martin Caballero
• Redentor:	Oct.25/09	Patamala 2do. CMTF
• Fortaleza:	Ene.20/09	Edgar Tovar
• Nemesis:	Nov.20/10	Fabian Ramirez

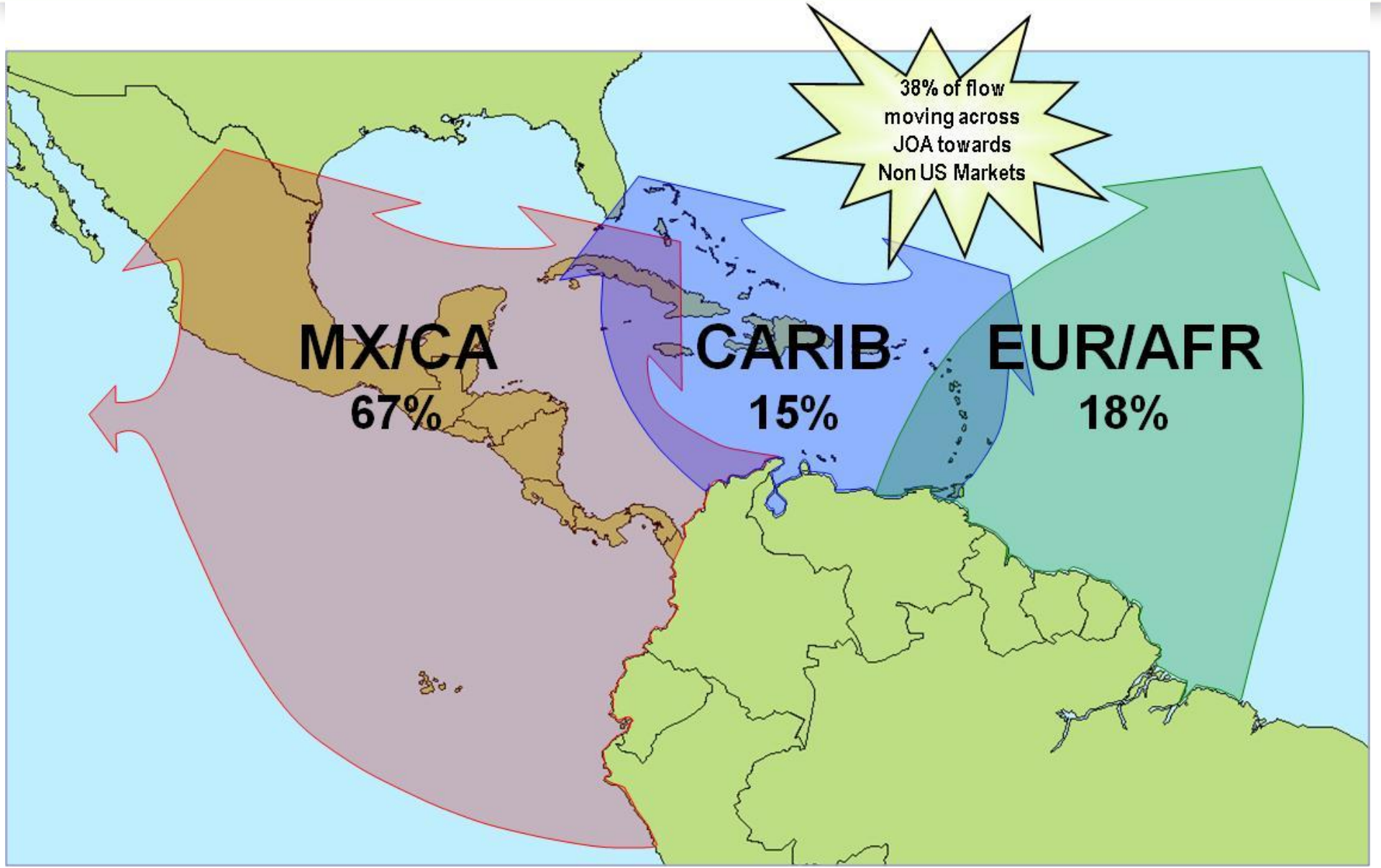
MARITIME INTERDICTION

- **Background**:

  - Challenges

  - Low cost technology vs. High profit

  - High Cost for Maritime Interdiction


38% of flow
moving across
JOA towards
Non US Markets
MX/CA
67%
CARIB
15%
EUR/AFR
18%

Republic of Colombia
Military Forces

1993 2002 | 2005 2006 2007 | 2008 2009 | 2010 2011







IMPROVED GO-FAST BOATS







SEMI-SUBMERSIBLES







SELF-SCUTTLING







SUBMERSIBLES DEVELOPMENT

Phase 1: Surveillance, reconnaissance and detection.

Phase 2: Interdiction over suspicious targets.



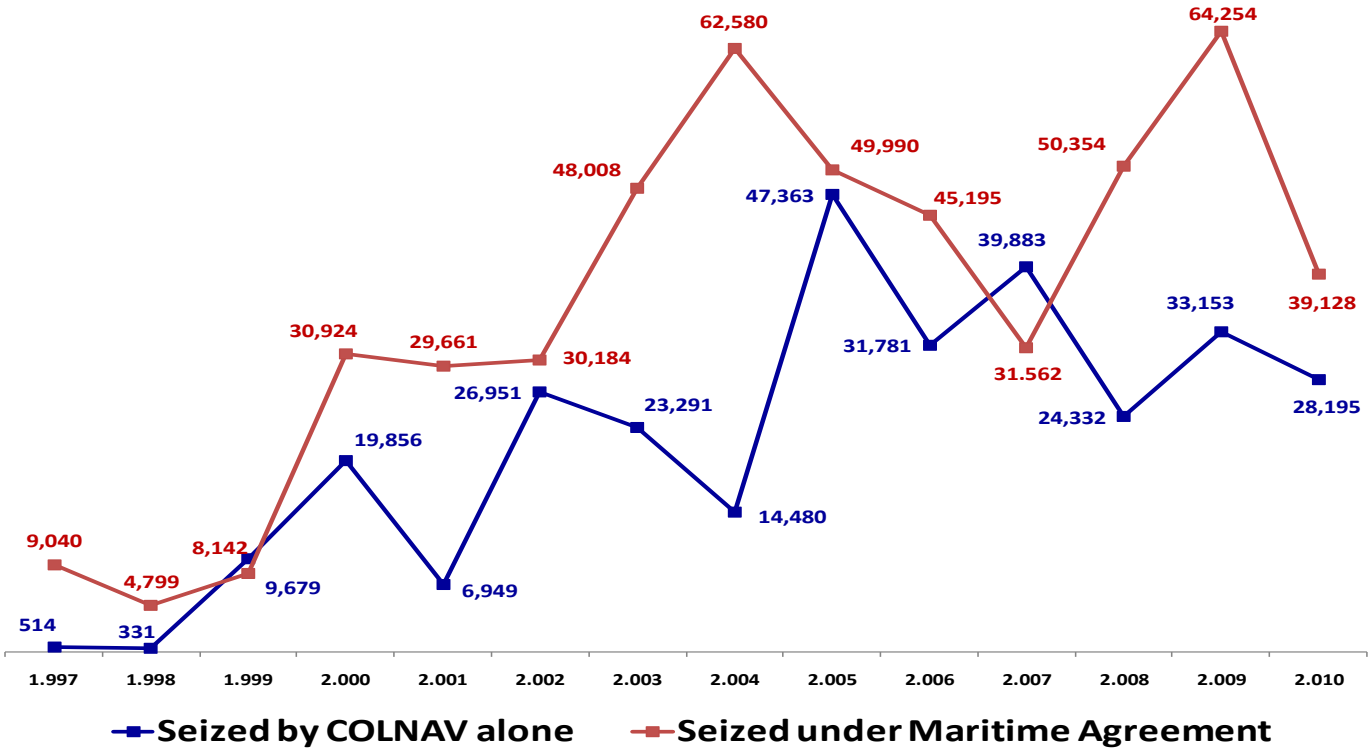
STRENGTHENING CAPABILITIES
- Development of Coastguard
- Interoperability
- Intelligence
- Training

IMPROVED COORDINATION
- Inter agency
- Inter institutional
- Legal processes

IMPROVED LEGISLATION
- Control of fuel
- Fishing areas
- Semisubmersibles law

RESULTS
- Maritime interdiction
- Information exchange
- Confidence

INTERNATIONAL LEADERSHIP, PRESTIGE AND SUCCESS IN COMBATING DRUGS



Total Seized Maritime Agreement:
503, 821 Kilos
US $ 12.59 Billion



Source: COLNAV Direction of Naval Operations

MARITIME INTERDICTION

- **Success Factors**:
  - Increased confidence of friendly nations
  - Maritime/aerial agreements
  - Creation of JIATF-S
  - Timely Communications
  - Operational Coordination
  - Common Strategies
  - COIN Development
  - Shared Experience and Training
  - Timely Intelligence Flow

LIMITATIONS

- Lack of technology for maritime detection of semi and submersibles
- High Cost of Intelligent/Smart Weapons
- External political Support
- Acquisition of modern technology

NEEDS

- Satellite Technology: Communications/Navigation/Intel
- Technology: Detection, Interception (Aerial-Maritime)
- Interception of Satellite Communications
- CAS: Maintain Precision, improve fire-power

The Colombian Security Forces are prepared to use, in a legitimate way, advanced technology with the purpose of neutralizing the narco-terrorist threat in Colombia and the Americas.

THANK YOU!

February 2011



Republic of Colombia
Military Forces

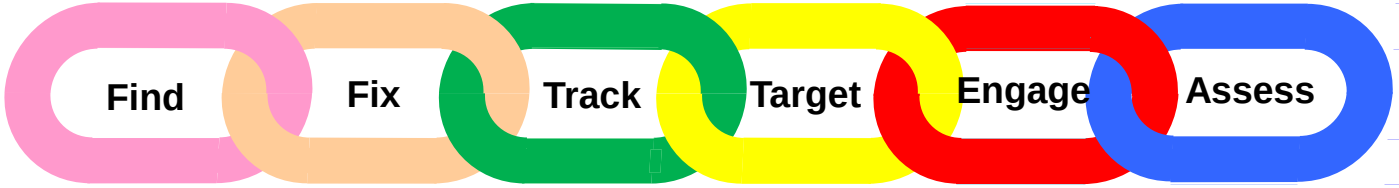
UNITED STATES SOUTHERN COMMAND



Precision Targeting
A USSOUTHCOM Perspective

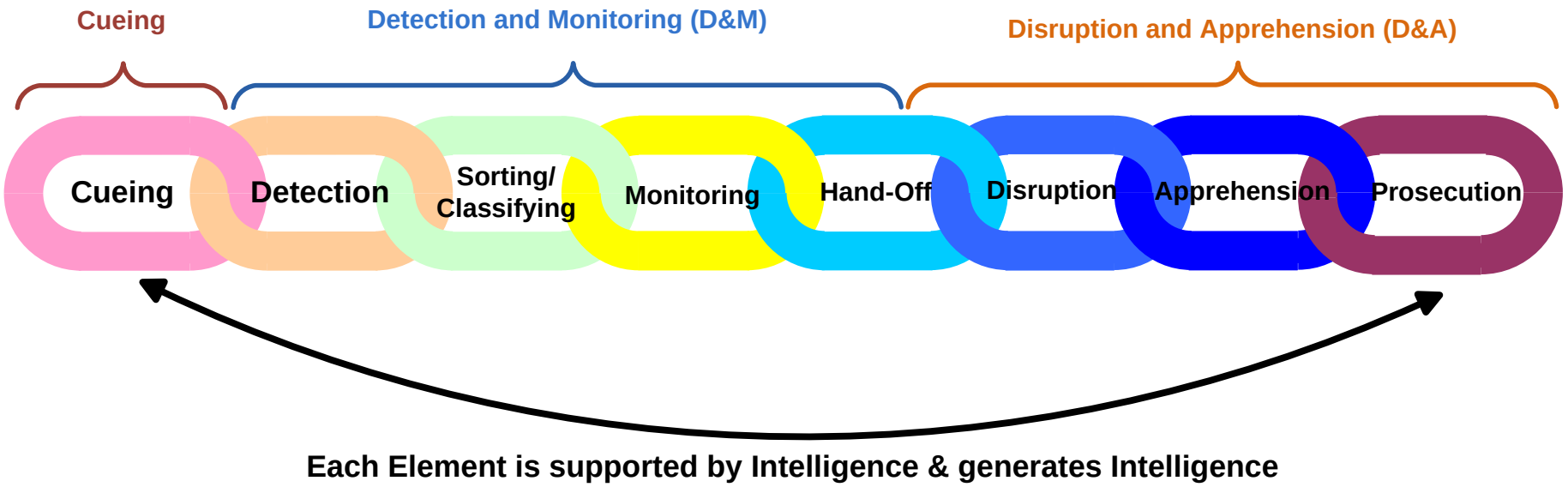
OVERALL CLASSIFICATION // UNCLASSIFIED

The Conventional Kill Chain

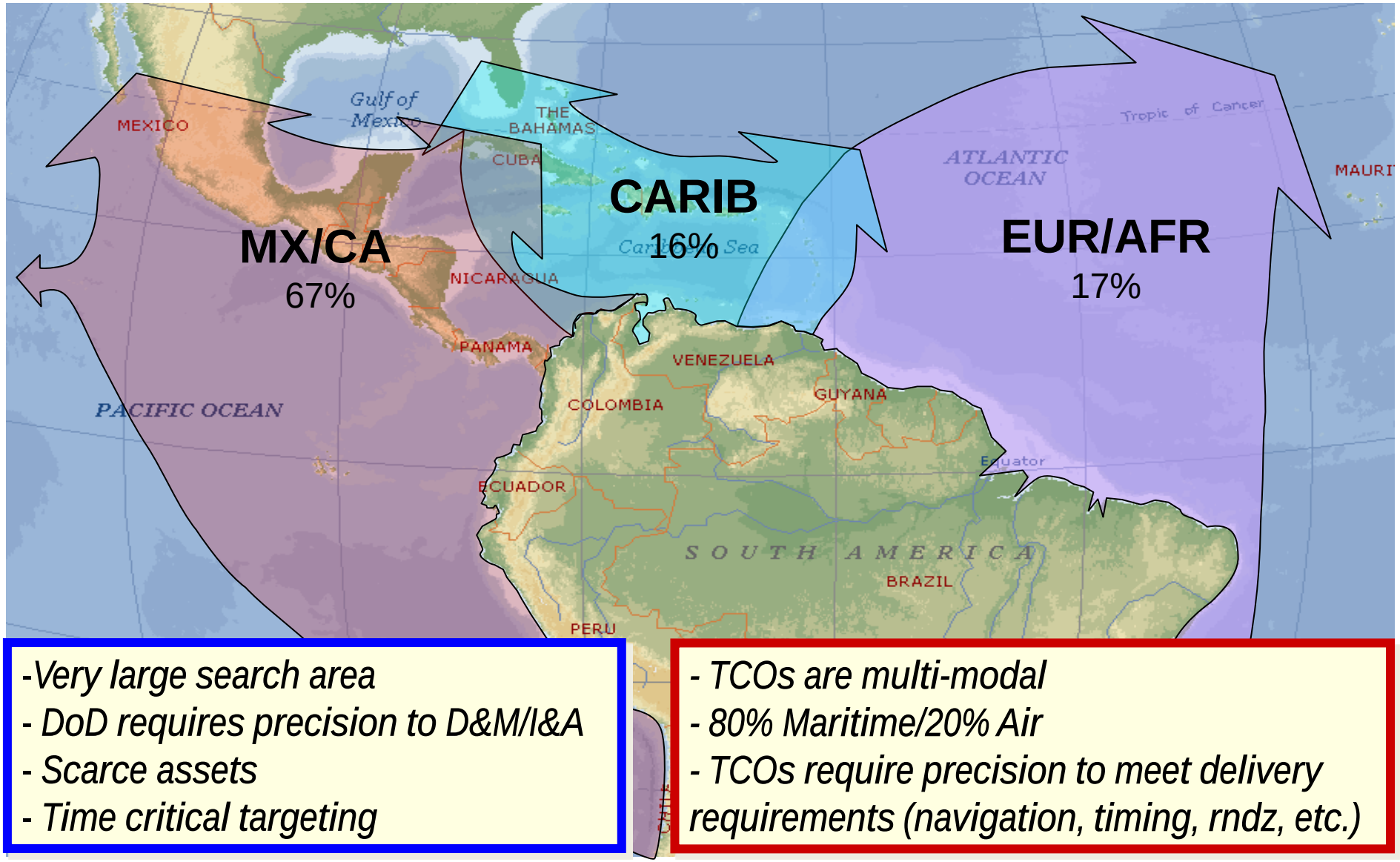




The CIT Kill Chain



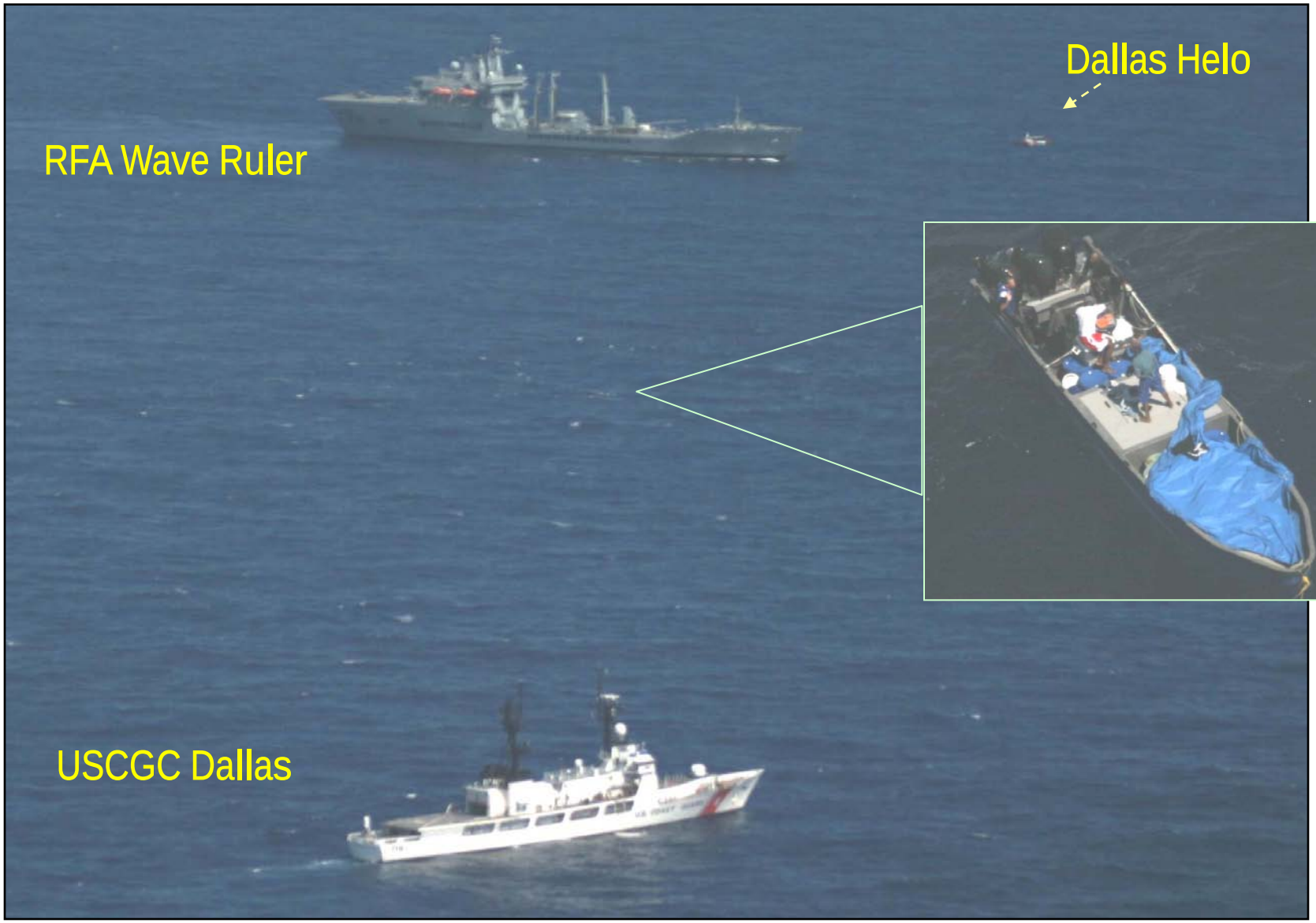
Friendly/Enemy Precision in the Transit Zone



-*Very large search area*
- *DoD requires precision to D&M/I&A*
- *Scarce assets*
- *Time critical targeting*

- *TCOs are multi-modal*
- *80% Maritime/20% Air*
- *TCOs require precision to meet delivery requirements (navigation, timing, rndz, etc.)*

Targeting Challenges (Go-Fasts)



Targeting Challenges (SPSS)





SPSS Interdiction
EPAC
JAN 2011





Targeting Challenges (SPFS)





SPFS Interdiction
Ecuador
JUL 2010





Targeting Challenges (SPFS)





SPFS Interdiction
Colombia
FEB 2011



Targeting Challenges (launch zones)



Suspect Maritime Activity 2010



402 Events

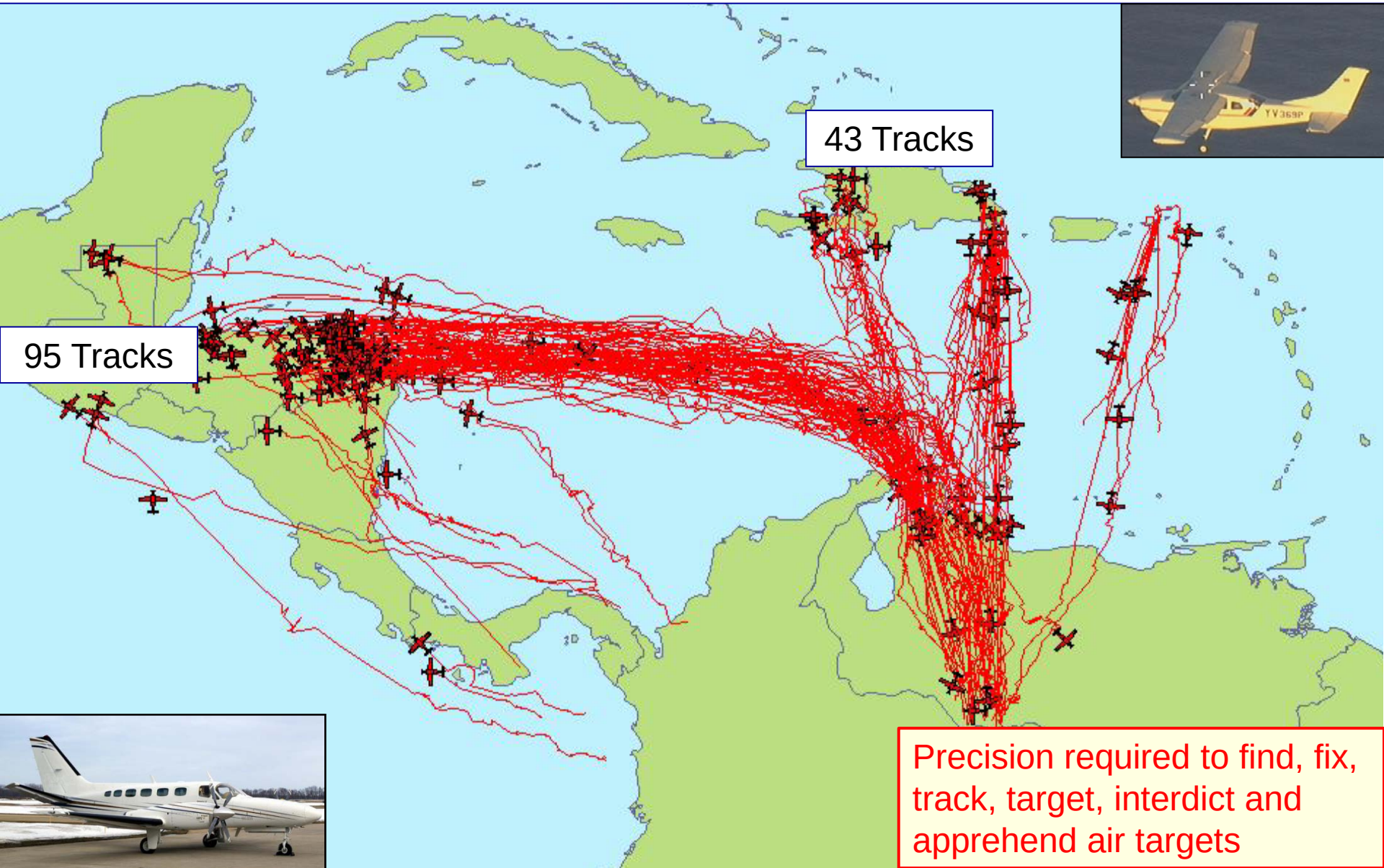
302 Events

Tracks include multi-vessel , various types, decoys, at-sea mother-ship rendezvous



Precision required to find, fix, track, target, interdict and apprehend maritime targets

Suspect Air Activity Comparison (ROTHR)



France priorities
“Combat engagement”

Precision Annual Strike Review
February 23-24, 2011



Colonel (Armament) Nicolas Hué

Defense Cooperation Attaché – Embassy of France
nicolas.hue@diplomatie.gouv.fr

MINISTÈRE DE LA DÉFENSE

DGA

AGENDA

- **The overall FRA context in six slides**
- **Combat Engagement “trends and examples”**
- **Conclusions**

Overview of Context – "White Paper"

- **World has changed profoundly** since 1994 FRA studies
  - Globalization : increased circulation of information, goods and individuals
  - Hierarchy of powers in constant evolution
  - World is more unstable, less foreseeable
  - France and Europe in a situation of greater vulnerability:
    - ➢Jihadism-inspired terrorism
    - ➢by 2025, within the range of ballistic missiles developed by new powers
  - New risks : cyber-attacks, environmental crises…
- **Major innovation compared to previous White Paper :**
  - Security interests are appraised globally, i.e. **not limited to defense issues** but include :
    - ➢Interior and civil security policies
    - ➢foreign policy, economic policy…

5 Forces Systems (Capability Areas)

- Deterrence
- Command, Control & Info. Superiority
- Projection, Mobility & Sustainability
- Combat Engagement
- Protection & Security



1. Though Deterrence, Knowledge and anticipation, Prevention and Protection are seen as top priorities,
2. A full “Combat engagement” capability is necessary

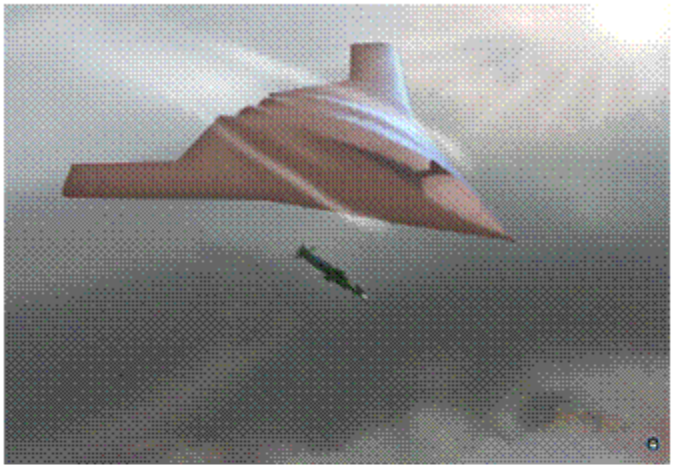
A financial effort

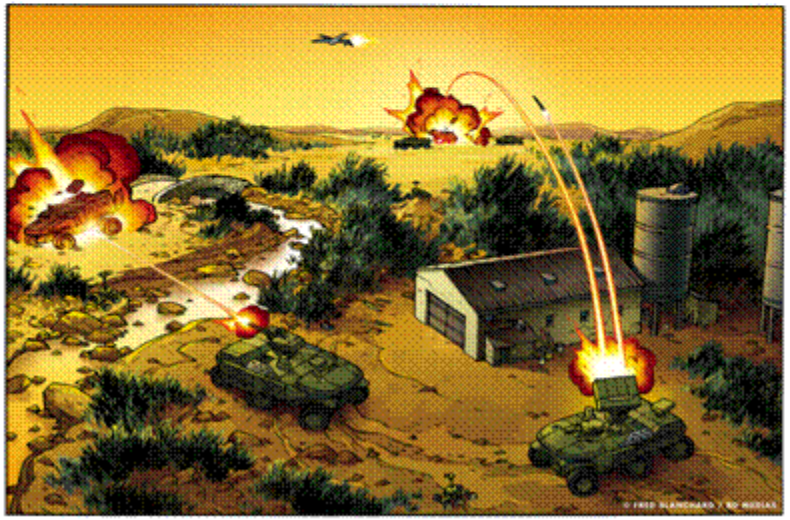
- **Consistent with the priorities and choices made for our operational capabilities**
- **Cost reduction**
  - Decrease of staff
  - Reduction of operating cost
- **Savings from MoD restructuring will be reinvested in the procurement budget**

A technology effort

Individual operations

- to check, in representative conditions of real utilization, that a prescribed level of performance is attainable





It contributes

- to reduce risks, delivery time and realization cost of future armament programs
- to motivate the teams on major projects
- to focus the co-operations on major projects

An effort towards Industry

Ensuring availability of key industrial capabilities

- **Fostering competition**
- **Management of 9 competitiveness poles**
- **Implementation of legal instruments dedicated to strategic SME's**

A co-operation effort

- European Defence development
- Transatlantic relationships development
- Co-operation programmes :

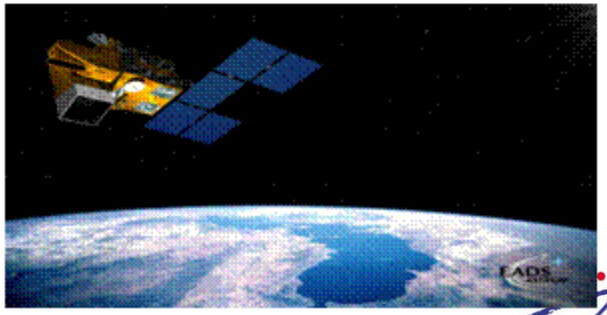
NH90, Tiger, A400M, FREMM, FSAF- PAAMS, ALTBMD, MIDS, ACCS…

- New co-operations :

Advanced-UAV, MUSIS, Software Defined Radio (ESSOR), ATHENA-FIDUS…



25% of budgetary resources set aside for co-operation programmes



Combat Engagement



Trends "Combat Engagement"

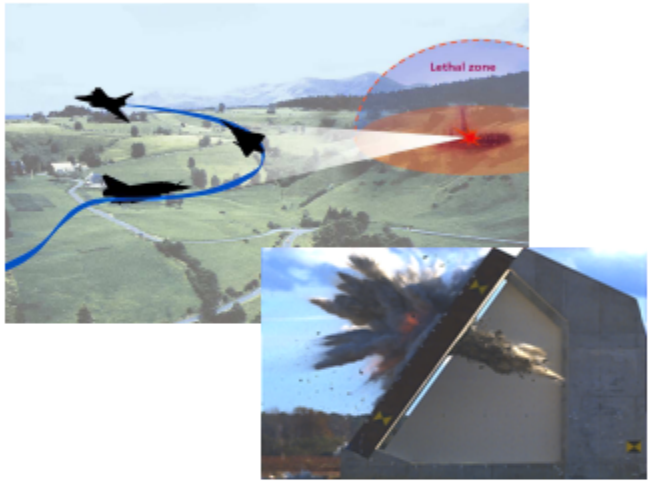
- **Asymmetric conflict**
  - Precision of armament and control of their effects
- **Low density of forces**
  - Long range, precise and fast support
- **Avoid unnecessary soldier exposure**
  - Robotics, artificial intelligence, deep area intervention (cruise missile, stealth plane)

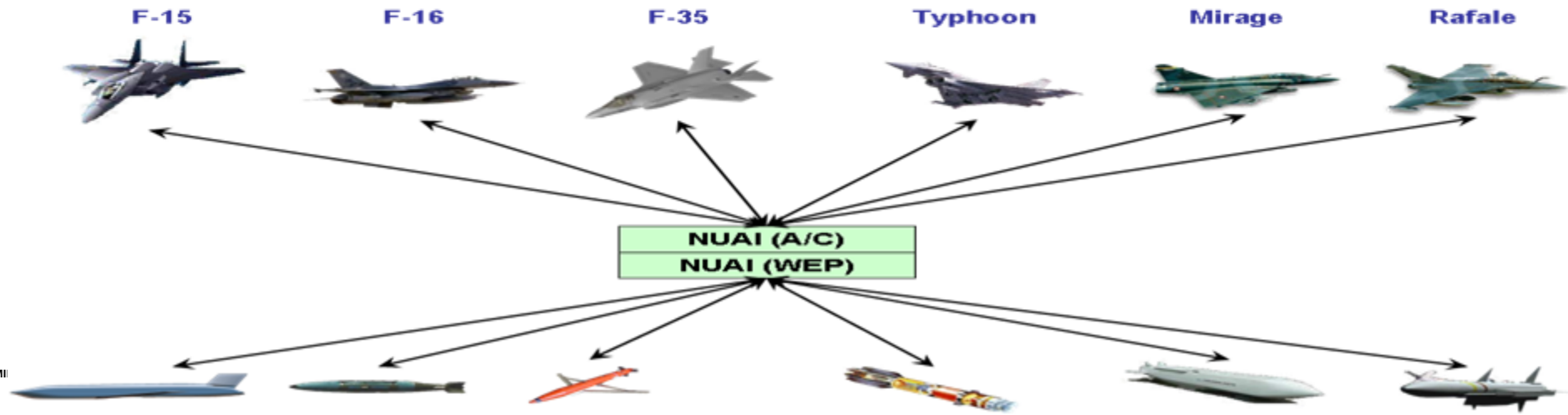


Caesar (NEXTER)

Application to the Air Force

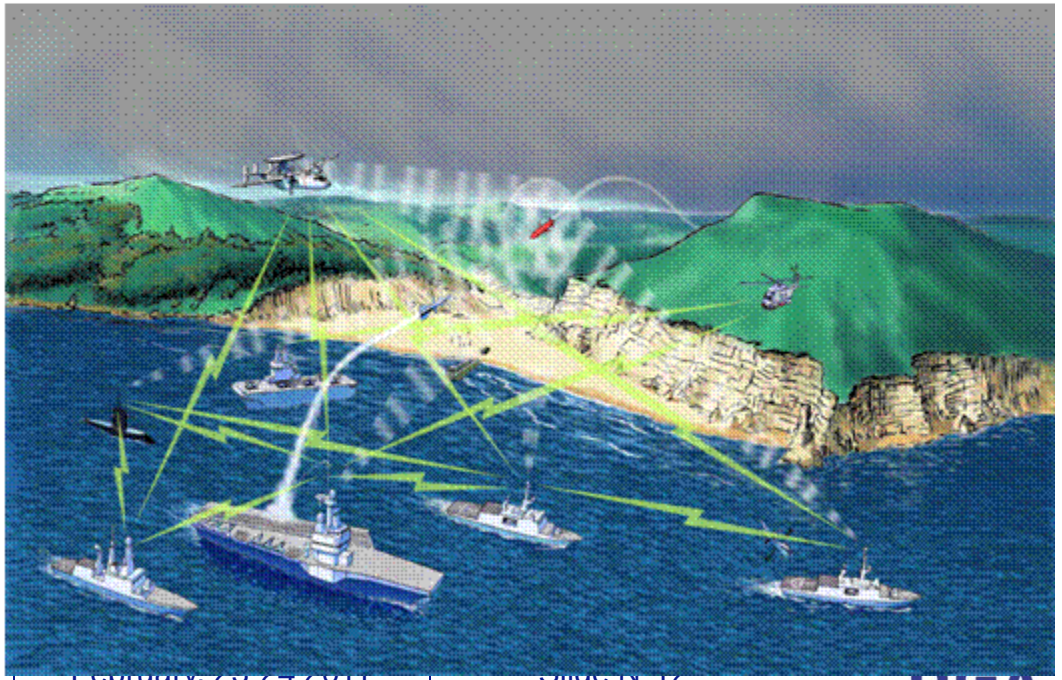
- **Priorities**
  - Multirole and Configuration management
  - Effect based solutions (identification and measure)
  - Quick Retex capability
  - *Interoperability*





Application to the Navy

- **Priorities**
  - Mine countermeasures
  - Sensor Optimization
  - *Networking Situation (Maritime situation awareness)*



Application to the Army

- **Priorities**
  - Protection IS KEY
  - Robotics and automatism
  - *Network architecture and interoperability*



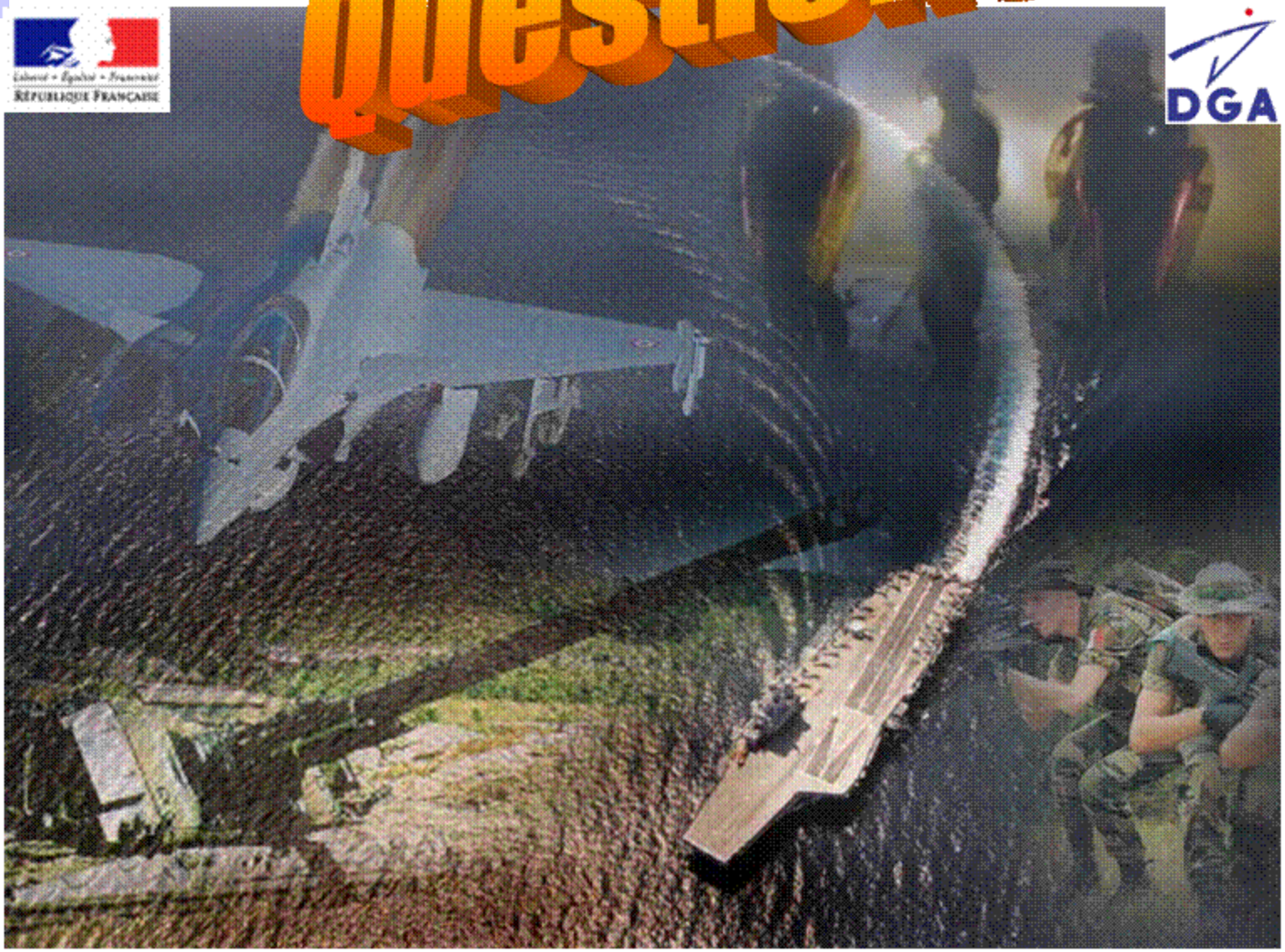




Conclusions

- **The context is changing rapidly**
- **Combat Engagement capabilities are still key assets in today's conflicts**
- **Interoperability/Cooperation among Allies is key in all domains of activities**

Questions ?




EJERCITO DE
CHILE

“OVERVIEW OF THE CHILEAN DEFENSE POLICY AND CHILEAN ARMY”

FT.WALTON BEACH, FL. FEBRUARY 2011

AGENDA

I. DEFENSE POLICY PRINCIPLES

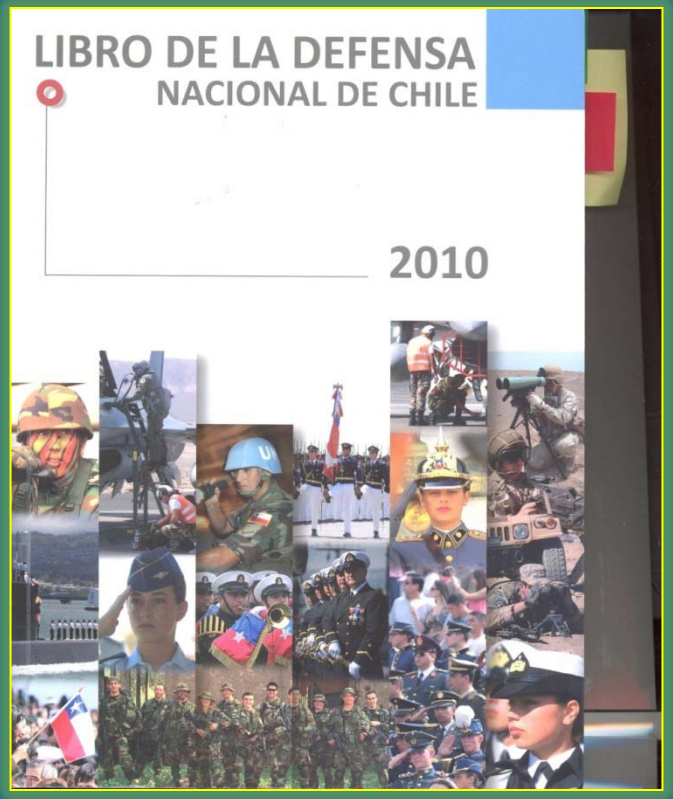
II. OVERVIEW OF THE CHILEAN ARMY

III. CHILEAN PEACEKEEPING POLICY

IV. CHILE AND UNITED STATES RELATIONSHIP

V. FINAL REMARKS

CHILEAN DEFENSE POLICY



- THREE BOOKS ON THE NATIONAL DEFENSE (1997-2003-2010) GROWING REGIONAL TRANSPARENCY.
- IT'S A STATE AND PUBLIC POLICY.
- DEFINE ALL NATIONAL SECURITY AND DEFENSE OBJECTIVES.
- GUIDANCE FOR THE DEVELOPMENT OF THE ARMED FORCES.
- COORDINATE OTHER STATE ACTORS.
- DETERMINE PRIORITIES FOR INVESTMENT OF MONETARY RESOURCES.

OVERVIEW OF THE CHILEAN ARMY

CHILEAN ARMY'S AXIS OF ACTIONS



DEFENSE

CHILEAN ARMY

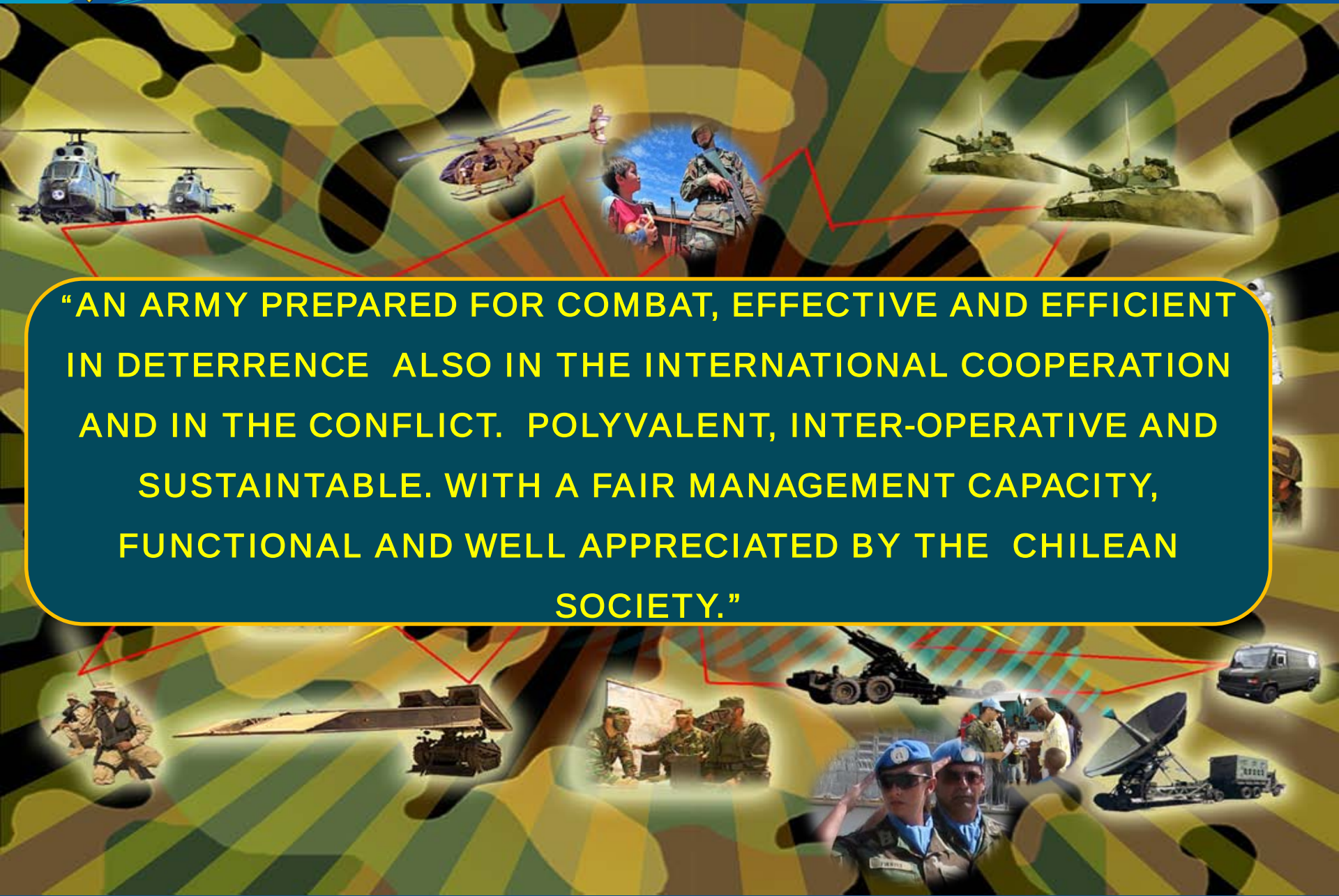


INTERNATIONAL SECURITY & COOPERATION



ARMY SOCIAL RESPONSIBILITY

ARMY'S VISION



"AN ARMY PREPARED FOR COMBAT, EFFECTIVE AND EFFICIENT IN DETERRENCE ALSO IN THE INTERNATIONAL COOPERATION AND IN THE CONFLICT. POLYVALENT, INTER-OPERATIVE AND SUSTAINTABLE. WITH A FAIR MANAGEMENT CAPACITY, FUNCTIONAL AND WELL APPRECIATED BY THE CHILEAN SOCIETY."

STRATEGIC ROLES FROM ARMY'S VISION

- REDUCTION OF THREATS
- ENHANCE NATIONAL POWER
- STRENGHTEN OF THE JOINT ACTION
- MAINTAIN THE PEACE

- INTEGRATION OF THE TERRITORY
- DIRECT CONTRIBUTIONS FOR THE DEVELOPMENT
- PARTICIPATION IN SCIENCE AND TECHNOLOGY



- INTERNATIONAL PRESENCE
- SUPPORT DETERRENCE
- PARTICIPATION IN PEACE OPS.
- REGIONAL AND LOCAL INTEGRATION

- CONTRIBUTION TO SOCIAL INTEGRATION
- PERMANENT PRESENCE THROUGHOUT THE TERRITORY
- SUPPORT IN EMERGENCIES AND NATURAL DISASTERS
- TRADITIONS, VALUES, HISTORICAL HERITAGE

TRANFORMATION OF THE ARMY

CULTURAL CHANGES

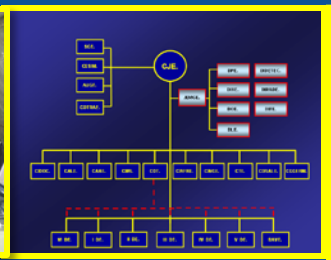
TECHNOLOGY

OPERATIONAL DOCTRINE

TRANSFORMATIONS COMPONENTS

PROCESSES AND MANAGEMENT

MORE EFFICIENT STRUCTURE





ARMY'S MAIN PROJECTS



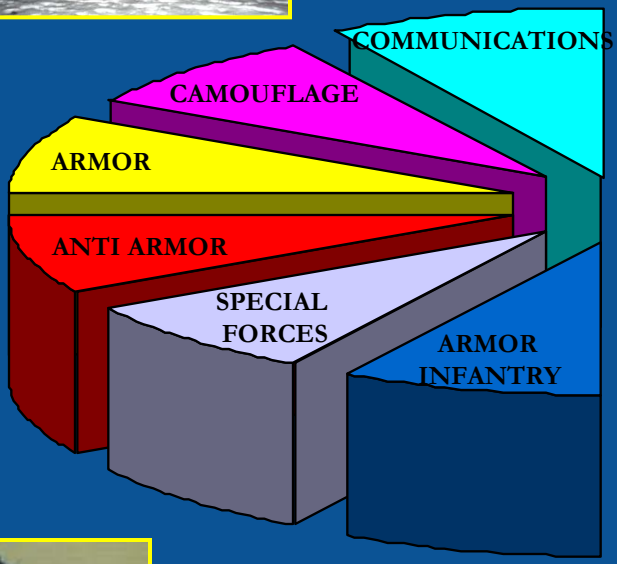










ADDITIONALY IMPROVE NATURAL DISATERS CAPABILITIES

ARMY'S MAIN TASK IN PEACE TIME



ADDITIONAL TASKS

HUMANITARY DEMINING





- DEMINING IN CONTINENTAL TERRITORY NORTHERN AND SOUTHERN AREAS
- PART OF DEMINING MISSION ECUADOR – PERU SPONSORED BY OAS (MARMINAS)

ARMY'S ANTARTIC PRESENCE

SCIENTIFIC RESEARCH COOPERATION ALONG WITH THE CHILEAN ANTARTIC INSTITUTE



CHILEAN ANTARTIC MILITARY PRESENCE FROM 1947
"BASE GENERAL BERNARDO O'HIGGINS"

MILITARY ENGINEERING POLICY IN SUPPORT OF NATIONAL DEVELOPMENT

- CONSTRUCTION OF ROADS AND BRIDGES IN ISOLATED AREAS OF THE NATIONAL TERRITORY
- 175,000 KM2 (67,570 ML2) CONNECTED BY LAND ROAD









NATURAL DISASTERS RELIEF

1960





1985

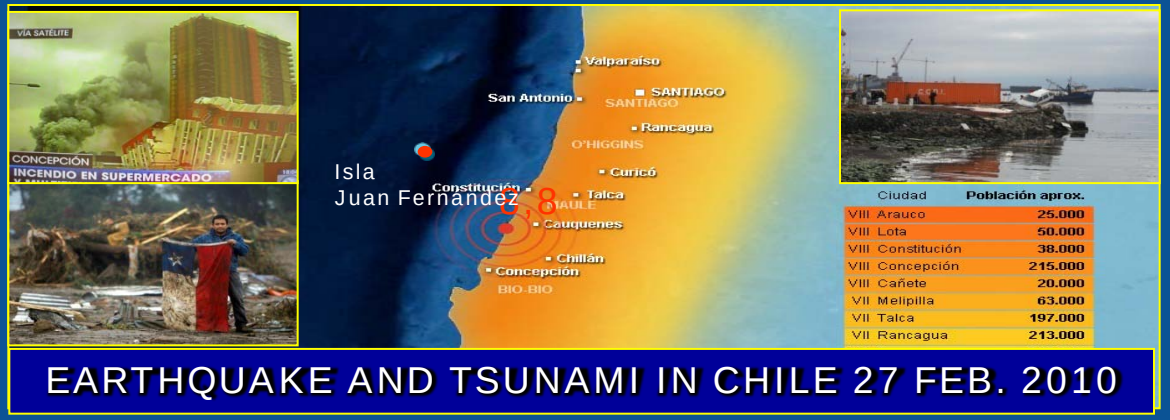


1971





2005



EARTHQUAKE AND TSUNAMI IN CHILE 27 FEB. 2010

ARMY'S RESPONSE TO THE EARTHQUAKE OF FEBRUARY 2010



4,602,139
Military troops deployment working hours



67,370
Emergency housisng



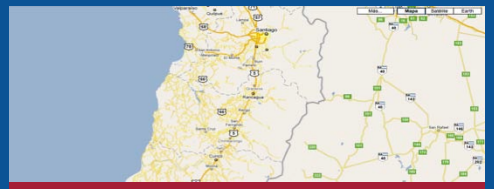
411,966 m3
Removing rubbish



26,640
Search and recovery victims of tsunami



19,256
Hiring civilians for working



Deployment along 117 counties

ARMY'S RESPONSE TO THE EARTHQUAKE OF FEBRUARY 2010



10,000
Number of Troops deployed



5,704
Tons of shipment delivered



1,540,608
Litres of waters delivered



5
Field Medical Post



7,035
Medical visits
2,969 Surgeries



304
Children born in Military Medical Facilities

ARMY'S RESPONSE TO THE EARTHQUAKE OF FEBRUARY 2010



9,741
Houses Repaired



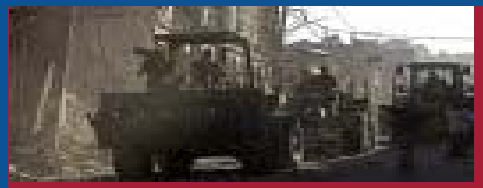
11,762
Affected civilians transported



1,283
Flight operation hours



976
Sorties



1,108
Vehicles and machinery deployed



4
Bridges deployed

ARMY INTERNATIONAL POLICY

SUB-REGIONAL

INTEGRATION AND CO-OPERATION



- CONFIDENCE - BUILDING MEASURES.
- CO-OPERATION AND INTEGRATION:
  - Peacekeeping Operations.
  - Humanitarian Aid Operations.
  - Bilateral Army Exercises.

ARMY'S INTERNATIONAL POLICY

REGIONAL





































- INTEGRATION AND COOPERATION STRENGTHEN
- DEVELOPMENT, TRAINING AND PARTICIPATION IN MULTINATIONAL ACTIVITIES:
  Peacekeeping Operations, Humanitarian Aid Operations, Bilateral Army Exercises

ARMY'S INTERNATIONAL POLICY

MULTI REGIONAL



- INTEGRATION AND COOPERATION STRENGTHEN
- ARMS SYSTEMS, TECHNOLOGY, EQUIPMENT, MAINTENANCE EXCHANGE AND PURCHASE
- MILITARY TRAINING AND INSTRUCTION
- DEVELOPMENT AND PARTICIPATION IN MULTINATIONAL ACTIVITIES:

  PEACEKEEPING OPERATIONS, HUMANITARIAN AID OPERATIONS, BILATERAL ARMY EXERCISES

CHILEAN POLICY IN PEACEKEEPING OPERATIONS









PRINCIPLES OF PEACEKEEPING OPERATIONS

- **Peacekeeping Operations must be according to the United Nations Resolution.**
- **Chile does not provide forces for the unilateral action.**
- **Chile decides participation on a case by case scenario.**
- **Unified Command and Control of the Forces.**
- **Multinational Composition Force.**



CURRENT DEPLOYMENT TROOPS

NEW YORK
Defense Attaché to the
DPKO-UN

BOSNIA – HERZEGOVINA
UNMBIH 1997 – 2002
OTAN / SFOR 2003 – 2004
EUFOR – ALTHEA since 2005

21

MIDDLE EAST
(UNTSO)
Since 1967

03

INDIA - PAKISTAN
UNMOGIP Since 1949
UNIPOM 1965 – 1966

02

HAITÍ
(MINUSTAH)

505 Military
15 Police

CHILE

CYPRUS
(UNFICYP)
Since 2001

16



TOTAL: 550

CHILEAN ARMY TROOPS DEPLOYED IN MINUSTAH (HAITI)

- FORCE COMMANDER
  - MINUSTAH-HQ: 3
  - CHILE Battalion: 355
  - Eng. Coy: 87
  - Aviation Unit: 56
- POLICE COMMISSIONER
  - POLICE: 15

TOTAL: 519







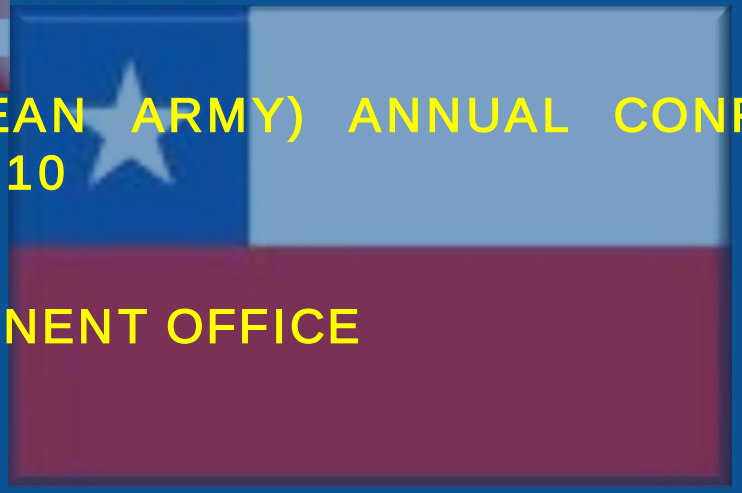
COMBINED PKO FORCE
CHILE - ARGENTINA



U.S. AND CHILEAN ARMIES RELATIONSHIP



- PERMANENT STAFF BILATERAL MEETINGS SCHEDULED (USSCOM – USAARSO)
- PARTNERSHIP AGREEMENT WITH TEXAS NATIONAL GUARD.
- PAMS (USARPAC/CHILEAN ARMY) ANNUAL CONFERENCE SANTIAGO DE CHILE 2010
- FMS (USACSAC) PERMANENT OFFICE



FINAL REMARKS

- ✓ CHILEAN ARMY HAS A STRONG BACKING TO BU[illegible] ITS OWN STRATEGIC DEVELOPMENT PLAN.
- ✓ CHILE HAD BEEN WORKING HARD TO [illegible]S ARMY WELL-EQUIPPED, TRAINED AN[illegible]RATIONAL TO MOVE ALONG THE OTAN STA[illegible]
- ✓ READY TO RESPON[illegible] DISASTERS.
- ✓ WITH SO[illegible] TO FULLFIL COMPLEMENTARY DUTIE[illegible]
[illegible]WIDE INTERNATIONAL AGENDA BASE ON ITS [illegible] POLICY
- ✓ CONSTRUCTIVE RELATIONSHIP BETWEEN THE CHILEAN AND THE U.S. ARMY.

ARMY PRECISION STRIKE

SECURITY AND DEFENSE = PEACE



MAJOR GENERAL
HUMBERTO OVIEDO

Office phone number: (202)965-9661
Email address: jmmchusa.org

PROGRAM EXECUTIVE OFFICE
MISSILES AND SPACE

PRECISION FIRES
ROCKET & MISSILE SYSTEMS

Precision Fires Rocket and Missile Systems

PSA Precision Strike Association

Recipients of the 2009 Secretary of Defense Performance-Based Logistics Award

Recipients of the 2008 William J. Perry Award

Precision Strike Association Annual Review

23 – 24 February 2011





COL David Rice
Project Manager

Any Warfighter - Anywhere - All The Time

PFRMS
Products

Launchers

M270A1



Full Tracked Weapon System on Bradley Chassis; fires entire MLRS / ATACMS Family of Munitions; 3 man crew; 12 rockets or 2 missiles / 2 pods; Improved Fire Control System (IFCS)

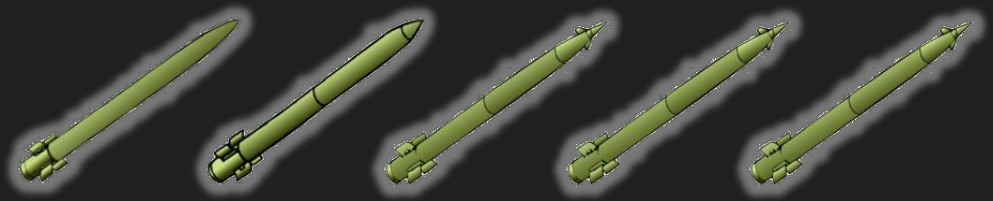
HIMARS M142



MLRS mounted on FMTV Truck Chassis; C-130 Transportable; fires entire MLRS / ATACMS Family of Munitions; 3 man crew; 6 rockets / 1 missile; Universal Fire Control System (UFCS); Pos-Nav and Reload system; organic / assigned to Modular Fires Brigades

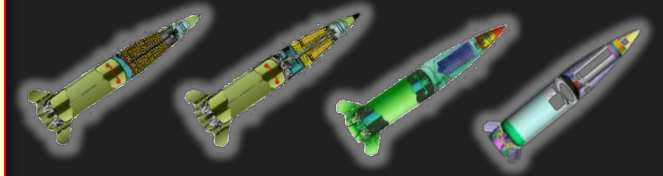


Rockets



M26	M26A2-ER	GMLRS DPICM (M30)	GMLRS Unitary (XM31)	GMLRS AW Alternative Warhead
644 M77	518 M77	404 M101	200 lb Class WH	
32 km	45 km	70+ km	70+ km	70+ km
Ballistic	Ballistic	Inertial / GPS Aided	Inertial / GPS Aided	Inertial / GPS Aided

Missiles



Block I (M39)	Block IA (M39A1)	QR Unitary (M48)	T2K (M57)
950 APAM	300 APAM	500 lb Unitary	500 lb Unitary
165 km	300 km	270 km	270 km
Inertial	Inertial / GPS Aided	Inertial / GPS Aided	Inertial / GPS Aided

Any Warfighter, Anywhere, All The Time

PFRMS Systems at War



- All systems are supporting the Global War on Terrorism
- Currently supporting Operation Iraqi Freedom and Operation Enduring Freedom
- Performance is above Army Standards
- Launchers returning in excellent condition requiring only routine and minimal maintenance



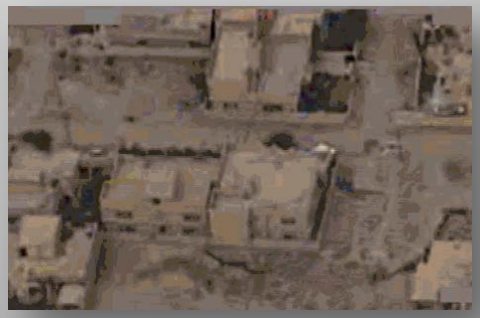
M270A1
98% Readiness Rate

HIMARS
99% Readiness Rate

GMLRS Unitary

ATACMS













Any Warfighter, Anywhere, All The Time

MLRS Worldwide Third Party Sales

MOU PARTNERS

US

UK

France

Germany

Italy

Active Cases

Slovakia

Finland

Norway

Denmark

Jordan

South Korea

Japan

Singapore

UAE

Kuwait (P&A Request)

Bahrain

Israel

Egypt

Turkey

Greece

Any Warfighter, Anywhere, All The Time

Thoughts on FMS Case Execution

- Essential to work with prime contractor business development staff
- Every customer is unique – understand their requirements
- FMS process built for comfort, not speed
- When case is signed, go to customer nation and establish relationships
- Deliver what you promise
- Leave no detail unattended (Corollary: It's OK to be creative)
- It pays to understand different cultures

Patience, Persistence and Attention to Detail

Common Misperceptions

- Economies of scale = reduced costs
- Too much travel
- It only benefits the contractor
- Too complex, too political
- Little to no benefit to underlying US program

Questions?

European Region Introductory Remarks

Colonel George A. Uribe, USAF
Chief, Operations & Training Division, Headquarters United States Air Forces in Europe

Thank you very much for the kind introduction, and my thanks to the association for the invitation to lead the European panel. For background I do not work in U.S. European command, but I do work in the air force component to EUCOM. I do not work in NATO, but I do work regularly with the NATO air component headquarters also based at Ramstein. I'm not going to describe Europe to you, as it has been around a lot longer than I have. My comments today aren't on behalf of NATO, but are to paint a picture of what is happening in the alliance and to share some considerations for precision strike there.

To prepare for this I attended the NATO senior officer staff policy course at the NATO school, which I highly recommend to any military or government personnel doing business with NATO. Since we are talking about precision strike I also spoke to the EUCOM targeting shop, and the target support element in the NATO air component headquarters at Ramstein.

I'll start by noting that NATO is in its third stage of life. It was born into the first stage, which was the cold war. That stage was of deterrence, where NATO showed its force but did not use it. Its forces were primarily deployed within the borders of the alliance. The second stage was the post-cold war stage where NATO had a role in re-ordering Europe, and through partnership linked it with nations on its periphery. This is also the first time that NATO started operating outside its own borders in the Balkans. The current stage is the post-9/11 or post-globalization stage. Here it is dealing with the security challenges that have arisen from globalization, its forces are operating even farther away to ensure its security, and its membership has further expanded. Today, NATO members and partners have 140,000 troops deployed in Europe, Asia, and Africa, and afloat in the Mediterranean and in the Somali basin. There is an arc of instability that extends from central and northern Africa to the Middle East, to the Caucasus and southern Asia to North Korea, many of NATO's operations are in the western half of that arc.

At the Lisbon summit last year, leaders of the alliance nations agreed on a new strategic concept. The alliance is in the planning stage to implement the new concept both politically and militarily. What is clear is that NATO will reform its structure, and like the nations that comprise the alliance, it is working to control costs and increase efficiency. The strategic concept focuses the alliance's efforts on three themes; collective defense, crisis management, and cooperative security. It is shifting its focus away from military-only solutions to face the new challenges that exist today and to establish new partnerships. Yesterday we heard admiral Roberti call it the "whole of government approach." NATO calls this the comprehensive approach, and it aims to integrate military, other government, and non-governmental organizations into both planning and execution stages of operations.

So with this background in mind I began to think about what the current security and fiscal environments mean for precision strike. First, I thought about what precision strike means to me. Is a guided bomb going through a specific window a precision strike? Certainly. Is a special operations team knocking down the right door and capturing a specific person a precision strike? You bet. How about

cyber precision strike? Consider the STUXNET virus. Strictly from open-source reporting, it exploited a security flaw in a piece of industrial equipment. It took action only when that equipment was in a very particular configuration, and has affected the Iranian nuclear program. Was that a precision strike? In its most generic sense a precision strike is a discrete action on a particular target to gain a certain effect.

While you think about that I'll say that it is easy to focus on the "striking" part of precision strike, just look at the much of the hardware displayed outside. But that diminishes the efforts on the very necessary before and after parts. What comes before, or left of the bang? The process to identify targets and characterize targets. The PSA vision statement lists them as "locate, fix, track, and target" before attack. After the strike is a necessary assessment process to see if it yielded the desired results. An effective precision strike capability requires the ability to execute the entire targeting life-cycle. The targeting personnel I spoke to are concerned that some nations have focused on the striking part, and still need to develop the others. Another point to ponder is that precision strike also requires supporting policy development. Precision strike may allow economy of force, and the ability to limit collateral damage. For example, though, each nation needs policies that determine the acceptable levels of risk of collateral damage, how those decisions are made, and who makes them. Another policy topic is if a target is not fixed, how is command and control exercised over the engagement?

Another reality is that many alliance members are facing drastic cuts in defense spending. There is concern about the extent of these cuts, as the NATO Secretary General said at the Munich security conference he is concerned that the fiscal crisis does not progress to a security crisis. In terms of percentage of cut, many NATO nations are contemplating reductions that are much larger America. There are also concerns that if spending is reduced too much the defense industrial base will be lost. Yesterday Major General Davis mentioned this could be starting here in the area of fuse technology. In this case outsourcing will be required. Today, many commercial-off-the-shelf components are manufactured by a near-peer, or global competitor. Yesterday Dr. Huessy talked about the need for EMP hardening, are these COTS components cyber-hardened following the example of STUXNET? Will defense planning become budget driven instead of risk driven? Will the hard power of NATO's military capability be diminished as to reduce the political maneuvering room it offers the alliance? These are tough issues being discussed in Europe, all while several other global actors are significantly increasing defense spending.

The Secretary General announced his concept of "smart defense" in Munich. It proposes to assist nations to develop greater security with fewer resources through coordination and collaboration. He acknowledges that many European countries cannot on their own develop the full range of responses to meet all security challenges. Through smart defense nations will pool resources, set priorities, and better coordinate their efforts. The defense industry, however, has been collaborating for some time now. You look at any new weapon system being rolled out and there are many different company stickers on the side. So either by force or by design you have figured out how to do it, and maybe there are lessons learned that can apply to national level collaboration in the alliance.

What are some characteristics of precision strike needs for European nations? I can think of three attributes that I'll share with you. First, it must be interoperable, a sentiment commonly stated in NATO

and echoed yesterday by Major General Snodgrass. Interoperability in equipment, in training, and in support. Both the EUCOM and NATO air component targeting staffs commented on the need for better standards for the "left of bang" parts of the engagement cycle. There are plenty of national systems that don't or can't talk to each other preventing effective precision strike in a coalition environment. They need systems that are designed from the beginning to share information to coalition partners, as clearly the age of unilateral action is passing. We have standards for weapons; we need standards for data as well. I see the association has a technology symposium later this year at the Secret/NOFORN level, if you want to lead efforts towards interoperability perhaps you can hold a later one at the Secret/REL NATO level.

A second attribute would be adaptability. Precision strike capabilities should be able to operate in as many of the five conflict domains as possible; air, land, sea, space, and cyberspace. NATO also acknowledges that future threats are likely to be hybrid threats. Though the Russian-Georgian conflict reminds us that traditional force-on-force conflicts can still happen, emerging threats encompass many others such as irregular warfare, terrorism, organized crime, cyber threats, and economic warfare. Yesterday adaptability was described as a weapon being able to have multiple effects, today I propose it is the ability to operate against multiple threats. Energy security is another important area of concern for NATO, so what threatens energy security and can precision strike capabilities engage those threats?

The last attribute is robustness, and I pulled it from one of the PSA goals which is to provide prudent alternatives in the event of enemy countermeasures. Think of the entire electromagnetic spectrum, and how we use it in the whole engagement cycle. We identify, characterize and track targets, we exercise command and control, we aim and guide weapons, we assess effects. We use visual, infrared, radar, laser, line-of-sight voice radio, satellite radio, datalinks, and GPS to accomplish these tasks. As Major General Davis said yesterday it is easier to thwart systems than to develop them, and today there exist capabilities to deny these parts of the E-M spectrum. How long have militaries used camouflage and concealment to deny visual observation? How do you retarget a long range strike weapon if the datalink is denied? Yesterday's excellent presentation on technologies to operate in a GPS-denied environment addresses that one niche, but a successful precision strike system will be able to deal with other parts of the spectrum being denied as well.

In closing, I'll ask for your forgiveness if you think I'm trying to tell the precision strike association what precision strike is. But, I'm a newcomer to this forum and sometimes a fresh perspective helps. There has been a lot of focus on the "bang" part, at least in Europe there is more work needed on the systems and policies for the before and after parts. The PSA vision statement challenges all to look at the entire engagement cycle, and not to focus on the traditional understanding of precision strike. For my last thought I'll share something I heard at the NATO school--the advantage of technology isn't just the technology itself, but the skillful exploitation of the opportunities it creates. With that I will turn it over to Group Captain Adlam, who will discuss the United Kingdom's recent defense review.